Integrating Burkhard Heim's Unified Field Theory into Management Science: A Quantum Approach to Organisational Complexity

David Leong[1], Lau Yin Cheng[2], Arthur Chen[3]

1 University of Canberra
2 National University of Singapore
3 National Cheng Kung University

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

This paper introduces an innovative approach by applying Burkhard Heim's Unified Field Theory to management science, integrating quantum physics principles to tackle modern organisational complexities. Heim's theory, which unifies gravity, electromagnetism, and quantum mechanics, discussed the interaction between consciousness and physical reality. The study demonstrates how this theoretical foundation can enhance our understanding of organisational behaviour and decision-making through concepts such as quantum flux, wave patterns, and energy exchanges.

Organisational leaders face significant challenges navigating complex situations within the chaotic and constantly changing four-dimensional reality. These limitations hinder their ability to comprehend and manage such complexities fully. By exploring how consciousness might intersect with higher dimensions, we can gain deeper insights into intuition and ideation mechanisms, potentially leading to more effective strategies for innovation and decision-making in business contexts.

A central theme of this study is the exploration of the mind-body-spirit triad, suggesting that spirit can be conceptualized as energy and, therefore, as a form of information. By integrating principles from quantum physics and information theory, the paper proposes that the spiritual aspects of human life can be understood through energetic and informational patterns mediated by individual consciousness, extending beyond mere physical and cognitive dimensions. This viewpoint is consistent with Heim's proposition that energy and information are fundamental elements of the universe. The paper introduces the concept of the complex conscious agent, an entity embodying the mind-body-spirit triad, which interacts with the fundamental elements of energy and information in higher dimensions to construct subjective reality in the lower four-dimensional spacetime.

By redefining spirituality as a combination of energy and information, the paper deepens the theoretical understanding of spirituality's impact on human behaviour and organisational processes. It examines how spiritual energy interacts with individuals' mental and physical aspects through Heim's 12-dimensional framework. This offers novel insights into

its influence on organisational culture, leadership, and teamwork. The research proposes a quantum-informed management model, emphasising the nonlinear and interconnected facets of organisational practices and human relations, integrating spiritual well-being into organisational effectiveness and culture.

David Leong[1,*], **Lau Yin Cheng**[2], and **Arthur Chen**[3]

[1]*University of Canberra*

[2]*National University of Singapore*

[3]*National Chung Kung University*

[*]Correspondence: david.leong@canberra.edu.au

Keywords: Information, Energy, Consciousness, Reality, Management, Leadership.

Introduction

In contemporary organisational settings, the complexities inherent in modern enterprises necessitate innovative management approaches to address the multifaceted challenges of today's business environment. Organisations increasingly operate in volatile, uncertain, complex, and ambiguous (VUCA) contexts, requiring a dynamic and flexible management approach. Traditional management theories, while valuable, often fall short in addressing the complex interdependencies and rapid changes characterising modern organisations. Thus, there is a pressing need for new frameworks that offer deeper insights into organisational behaviour and decision-making processes, enabling organisations to thrive in an ever-evolving landscape. The complexity of modern organisations is further compounded by increasing market globalisation, rapid technological advancements, and the growing importance of knowledge and information as critical drivers of competitive advantage. Understanding organisational behaviour and decision-making dynamics becomes essential. This understanding necessitates a shift from linear, cause-and-effect models to more holistic and integrative approaches that capture the nuanced interplay of various factors influencing organisational outcomes.

Incorporating the mind-body-spirit framework, where the mind represents consciousness, the body signifies the manifested physicality of observable objects, and the spirit embodies the energy arising from the mass-energy-information equivalence, offers a comprehensive perspective. This approach acknowledges the interconnectedness of cognitive processes, tangible actions, and underlying energetic forces, providing a robust foundation for addressing modern organisational behaviours and decision-making complexities. This paper enriches the dialogue on the mind-body-spirit triad by introducing a framework that views the spirit in the energetic and informational dimension. In this context, a complex conscious agent is defined as an entity embodying the mind-body-spirit triad, which operates in multiple

dimensions to form subjective reality. Specifically, within Heim's 12-dimensional framework, these agents interact with fundamental elements of energy and information in higher dimensions, which in turn manifest as subjective reality in the lower four-dimensional spacetime.

The mind-body-spirit interaction involves the mind, or consciousness, processing information and making decisions, the body enacting these decisions in the physical world, and the spirit representing the energetic and informational basis underlying these processes. In Heim's theory, energy and information are foundational elements that permeate higher dimensions, and it is through the complex interplay of these elements that conscious agents construct their subjective experiences. The spirit, viewed as a form of energy and information, interfaces with these higher dimensions, influencing both cognitive and physical realities, thus enabling a deeper understanding of the mechanisms driving human behaviours and perception. Thus, the information-centricity of this framework underscores the importance of understanding how informational patterns and energy dynamics in higher dimensions influence the formation of subjective reality in the lower dimensions. This perspective emphasises the role of the complex conscious agent, whose mind-body-spirit triad functions in an interconnected manner, processing and responding to the energetic and informational inputs from the higher dimensions to create coherent experiences and behaviours within the familiar four-dimensional spacetime.

"Information has a significant role in quantum physics, and that role seems to go beyond the role it plays in physics" (Zeilinger, 2010, p. 267). This paper explores the proposition that information constitutes a fundamental aspect of the universe, analogous to matter and energy, within a theoretical framework that views the universe as fundamentally informational. Operationally, information is conceptualised based on its capacity to organise systems, mirroring how energy is defined by its ability to perform work. The interdependence between energy and information is emphasised, illustrating that pure energy cannot execute 'useful' work that reduces entropy without inputting information and observation. Similarly, any energy expenditure invariably results in the universe's reorganisation, altering its informational content (Tom Stonier, 1996).

Fields' (2012) exploration provides a compelling critique of traditional notions of observation within the context of information science and quantum mechanics. Fields (2012) highlighted the limitations imposed by an observer's capacity to encode and interpret information from their environment. This critique underscores a pivotal shift from viewing observers as passive recipients of information to recognising their active role in interpreting and representing data. The implications of Fields' (2012) argument extend to broader considerations within quantum mechanics, particularly in the context of quantum Darwinism[1] (Zurek, 2009). This theory posits that the environment acts as a communication channel, disseminating information about quantum states through decoherence processes. Fields' (2012) emphasis on the observer aligns with the notion that observation is an interactive process reliant on the observer's capacity to decode and understand environmental signals.

However, Fields' (2012) challenge to the coherence of the Galilean observer[2] paradigm necessitates reevaluating how information is perceived and processed in classical and quantum contexts. The Galilean observer, devoid of prior information and linguistic capability, represents a theoretical extreme that fails to account for the complexities of real-world observation. In contrast, the minimal observer model, constrained by their cognitive capabilities, offers a more realistic

framework that acknowledges the intrinsic limitations of information processing and representation. This discussion aligns with broader themes in the philosophy of science, particularly regarding the nature of measurement and the role of the observer.

In summary, Fields (2012) challenged the traditional concept of the Galilean observer by emphasizing the critical role of the observer's encoding and interpretative capacities. His analysis underscores the need to reconceptualise observation as an interactive process constrained by the observer's descriptive abilities. This perspective aligns with Leong (2021), who employed signalling theory to offer new insights into the entrepreneurial process as it transitions from perception to recognition and enactment. Entrepreneurs perceive opportunities and form initial opportunity beliefs. Leong (2021) recognised that these beliefs evolve. Consequently, the perceived potentialities from the signals associated with opportunities also change. The strength of initial opportunity beliefs, the adaptability of opportunities, the frequency of their appearance, the multiplicity of their interpretations, their latency, and their observability (including intensity, visibility, strength, and clarity), as well as the distortions and false opportunities, are topics insufficiently addressed in existing entrepreneurial research.

This paper argues that the signalling effects generated by information open new avenues for investigating the crucial role of opportunities or business initiatives within the business process. It further advocates for the principle of mass-energy-information equivalence, suggesting a paradigm shift that challenges traditional physics perspectives (Harman, 1982). The mass-energy equivalence principle famously encapsulated in Einstein's (1935) equation $E=mc^2$, revolutionised our understanding of matter and energy by demonstrating their interconvertibility. Harman (1982) challenged traditional physics perspectives by suggesting that this principle could also be extended to include information. This idea is further supported by Baek (2023), who highlighted the growing recognition of information as a fundamental component of the physical universe. Baek (2023) argued that, similarly to the interchangeability of mass and energy, information can be converted into energy and vice versa. Thus, this foundational concept posits that not only are mass and energy equivalent but information can also be transformed into energy and vice versa, thereby establishing a triadic equivalence. This mass-energy-information equivalence (MIE) principle suggests a more integrated understanding of physical reality. It propels a narrative where information is not just a passive descriptor of physical states but an active, governing principle of reality itself (Vopson, 2019).

> *Most intriguingly, at the nexus of these formal approaches a new ontology of reality is becoming most apparent. Two novel mantras are spreading through humanity's collective mind: "Information is physical" and "Information represents the ultimate nature of reality." These surprisingly simple assertions have many deep consequences (Glattfelder, 2019, p. 473).*

Furthermore, it elevates the concept of information to the level of a tangible physical entity capable of representing macroscopic entities such as humans, organisations, or ideas. This paradigm shift extends beyond the mere reconceptualization of matter, suggesting that information holds intrinsic physical value and is integral to understanding the universe's structure and dynamics. By viewing information as an active force that can influence and be influenced by

energy, we can better understand the dynamics of opportunity recognition and exploitation. Organisational leaders operate in environments rich with informational signals, which can be seen as energy exchanges that affect their cognitive processes and decision-making.

This approach suggests that business opportunities can be viewed as energetic events, with information serving as the medium for recognition and action. The mutual convertibility of mass, energy, and information implies that entrepreneurial success depends on effectively harnessing and transforming informational signals into actionable business initiatives. This paper proposes that the signalling effects of information open new research avenues for understanding opportunities in the business process. By advocating for the principle of mass-energy-information equivalence, it challenges traditional views and suggests a more integrated approach to organisational leadership. This perspective enhances theoretical understanding and has practical implications for identifying and exploiting business opportunities. It emphasises the intrinsic interconnectedness among matter, energy, and information, advocating for a comprehensive methodology to address the complexities of both physical and social sciences. This holistic view enriches our understanding of physical phenomena and offers insights into human interactions and organisational structure challenges.

In response to contemporary organisational challenges, this paper introduces a novel approach by applying Burkhard Heim's Unified Field Theory to management science. Heim's theory, which integrates gravity, electromagnetism, and quantum mechanics into a unified framework, offers a fresh perspective on the interplay between consciousness and physical reality. This theoretical base provides a new lens to examine the complexities of organisational behaviour and decision-making, leveraging concepts from quantum physics to enhance our understanding of these phenomena.

Burkhard Heim, a prominent German physicist, developed his Unified Field Theory to unify the fundamental forces of nature into a single theoretical structure. His theory extends beyond the conventional four-dimensional space-time continuum, proposing a 12-dimensional framework. This framework offers profound insights into the nature of reality, suggesting that energy and information are fundamental elements of the cosmos and that consciousness plays a crucial role in shaping our perception of reality. Applying Heim's theory to management science involves exploring how these fundamental elements—energy, information, and consciousness—interact within organisational contexts. This approach aligns with emerging trends in management research that seek to incorporate principles from quantum physics and complexity science to develop more holistic and integrative models of organisational behaviour.

The analogy between the fundamental forces of physics—gravity, electromagnetism, and the strong and weak nuclear forces—and the dynamics within organisations provides a sophisticated framework for interpreting organisational behaviour and structure. Gravity metaphorically represents the grounding effect of corporate reality, stabilising organisations amidst external chaos. This metaphor extends to all entities within the organisation, including ideas and thoughts, which, as forms of information, are equivalent to energy and interchangeable with mass; thus, gravity equally applies to them all.

Within this framework, each individual is considered a mind-body-spirit entity interacting within the organisational system, engaging in electromagnetic-like interactions that facilitate communication and connectivity among people. Liboff (2017) demonstrated that living organisms, including humans, are sensitive to extremely low-frequency magnetic fields even at

minimal intensities, suggesting that individuals can be magnetically detected by those nearby. This sensitivity implies that even simple magnetic cues, unconsciously received during prolonged close interactions, can lead individuals to associate these cues with the transmitting person, akin to how visual or auditory signals are perceived.

> *It has been established that living things are sensitive to extremely low-frequency magnetic fields at vanishingly small intensities, on the order of tens of nT. We hypothesize, as a consequence of this sensitivity, that some fraction of an individual's central nervous system activity can be magnetically detected by nearby individuals. Even if we restrict the information content of such processes to merely simple magnetic cues that are unconsciously received by individuals under- going close-knit continuing exposure to these cues, it is likely that they will tend to associate these cues with the transmitting individual, no less than would occur if such signals were visual or auditory (Liboff, 2017, p. 177).*

The strong nuclear force is analogous to the robust ties and shared aspirations that fortify an organisation's core values and mission, ensuring structural integrity under pressure. This force reflects the cohesive elements that hold the organisational structure together, much like how the strong nuclear force maintains the integrity of atomic nuclei.

Conversely, the weak nuclear force represents organisational innovation and adaptation, highlighting the importance of fostering a culture of innovation to drive the organisation's evolution. This force symbolises the dynamic aspects of the organisation that allow it to adapt and transform, analogous to the weak nuclear force's role in processes like radioactive decay, which leads to the transformation of elements.

In this metaphorical framework, the interplay of these fundamental forces provides a nuanced perspective on the multifaceted dynamics of organisational life, emphasizing the importance of stability, communication, cohesion, and innovation in maintaining and advancing organisational integrity and effectiveness.

This comparison underscores the importance of recognising the less apparent forces within organisations, akin to exploring unseen dimensions in theoretical physics, thus broadening our comprehension of organisational dynamics. By integrating insights from diverse disciplines, management science can more effectively illuminate the intricate, emergent behaviours characteristic of organisational life. This interdisciplinary approach applies existing knowledge to organisational contexts and reinterprets these concepts, offering new avenues for research and practice in organisational development and management.

Therefore, investigating the unseen dimensions within the cosmos and organisational environments advocates for a shift towards holistic, integrated models of understanding. Highlighting the significance of emergent phenomena and system interconnectedness, this approach posits that organisational success and sustainability derive not solely from tangible resource manipulation but from adeptly navigating the nuanced, dynamic interplays of organisational forces. This perspective encourages a broader, more comprehensive approach to organisational management, emphasising the invisible yet impactful forces that drive organisational dynamics.

This forward-thinking perspective propels theoretical discourse and bears implications for practical applications, aiming to enhance holistic well-being and performance across personal and professional spheres. By delving into the synergies among energy, information, and the human essence through consciousness, this study prompts a critical reconsideration of traditional wellness, well-being, and organisational leadership paradigms, endorsing a more holistic and spiritually nuanced approach.

Adopting a cross-disciplinary methodology, the present paper scrutinises the potential of Heim's Unified Theory to devise a quantum-informed framework for management. This framework acknowledges the complex, non-linear interplay between business processes and human interactions within organisational settings. The proposed model heralds a paradigmatic shift in leadership approaches and organisational transformation strategies, fostering work environments that are more flexible, resilient, and in harmony with the nascent principles of the quantum era. By weaving quantum physics principles into the fabric of management theory, the paper illuminates novel pathways for manoeuvring through the complexities and volatilities characteristic of contemporary business landscapes, advocating for a deliberate evolution in organisational management and leadership practices.

The primary objective of this conceptual paper is to explore the application of Burkhard Heim's Unified Field Theory to management principles, specifically investigating the synergy between consciousness and physical reality in organisational behaviour and decision-making. By leveraging Heim's theoretical framework, the paper aims to enhance our understanding of how energy and information shape reality within organisational contexts and to develop a new management model that integrates spiritual well-being into organisational effectiveness and culture.

The scientific method, a cornerstone of hard sciences, emphasises objectivity, experimental verification, and replicability. This methodological rigour inherently restricts the scope of scientific inquiry to phenomena that can be observed and measured within the four-dimensional spacetime framework. Higher dimensions, while theoretically plausible and mathematically consistent in various advanced physical theories, elude direct human observation and empirical measurement (Kafatos & Nadeau, 2012). In classical physics, spacetime is treated as a four-dimensional continuum composed of three spatial dimensions and one temporal dimension (Einstein, 1916). This framework allows for the consistent description of physical phenomena within the limits of human perception and measurement capabilities. However, the observable realities within this framework are inherently subjective due to the constraints and limits of human cognitive interpretation. Human perception is limited by our sensory faculties and the tools we use to extend these faculties, such as telescopes and particle detectors (Davis, 2013). These limitations mean that the realities we observe are filtered through the lenses of our perceptual and cognitive apparatus, which can only interpret information within certain bounds.

Given these constraints, the realities we perceive are not absolute but shaped by the context of our observations and the frameworks we use to interpret them. For instance, two observers in different states of motion may perceive different sequences of events due to relativistic effects such as time dilation and length contraction, as predicted by Einstein's theory. This relativity of simultaneity illustrates how different frames of reference can lead to different but equally valid interpretations of the same physical phenomena. Despite the subjectivity introduced by perceptual limitations, the

underlying physical phenomena do not change. The laws of physics, as described by general relativity, remain invariant across different frames of reference. This invariance means that while the way we observe and interpret these phenomena may vary, the phenomena themselves are constant. For example, the curvature of spacetime around a massive object like a star or planet is a physical reality that exists independently of any observer's frame of reference. However, the specific way this curvature is perceived—such as the degree to which light bends around the object—can differ depending on the observer's position and motion relative to the object.

This limitation excludes any consideration of spiritual or philosophical constructs originating from higher-dimensional consciousness from hard science. Despite the methodological constraints of hard sciences, there is growing interest in exploring the potential connections between consciousness and higher dimensions, particularly within interdisciplinary studies that blend physics, psychology, and cognitive science. Though rooted in non-material principles, these interfaces offer a fertile ground for speculative inquiry and theoretical modelling. By examining these connections, researchers can gain novel insights into human cognition, intuition, and creative ideation processes.

Understanding the potential interfaces between consciousness and higher dimensions can significantly impact business and entrepreneurship. Intuition and creative ideation, often cited as critical components of successful entrepreneurial ventures, might be better understood through the lens of higher-dimensional consciousness. This perspective suggests that certain cognitive processes could be influenced by, or even originate from, dimensions beyond the conventional spacetime continuum.

Traditional hard sciences often exclude the energetic and philosophical dimensions of higher consciousness. However, exploring these interfaces can offer valuable insights into human cognition and business practices. Organisational leaders, operating within the chaos and constant changes of a four-dimensional reality, face numerous challenges and dilemmas as they navigate complex situations characterised by many interacting variables. This limitation restricts their ability to comprehend and manage such complexities fully. We can enhance our understanding of the mechanisms underlying intuition and ideation by investigating how consciousness might intersect with higher dimensions. This perspective could lead to the development of more effective strategies for innovation and decision-making in business contexts. Integrating concepts of quantum consciousness into leadership practices can offer new paradigms for thinking and acting in complex, dynamic environments. This interdisciplinary approach enriches our theoretical understanding and provides new avenues for practical applications in entrepreneurial and organisational domains. Acknowledging and incorporating higher states of consciousness can transform traditional business models and leadership strategies, fostering a more holistic and adaptive approach to organisational challenges. A deeper understanding of the interconnectedness of all things, as posited in quantum theory, can fundamentally alter our perception and management of business practices. By exploring how consciousness interacts with higher dimensions, we can develop more nuanced and effective strategies for innovation and decision-making. This approach broadens our theoretical horizons and provides practical tools for navigating the complexities of modern business environments.

The study addresses several research questions to achieve these objectives: How can Heim's Unified Field Theory enhance our understanding of organisational behaviour and decision-making? What role do energy and information play in

shaping reality within organisational contexts? How can integrating energetic well-being improve organisational effectiveness and culture?

Given that this is a conceptual paper, the methodology involves an extensive literature review to build a framework for understanding consciousness and reality based on the observer's relative position and level of consciousness. The review will encompass existing theories and research across multiple disciplines, including quantum physics, management science, consciousness studies, and information theory. This integrative approach synthesises insights from these fields to develop a coherent framework for quantum-informed management.

The literature review will cover several key areas: a detailed exploration of Heim's Unified Field Theory and its implications for understanding reality; the application of quantum physics principles to management science, including concepts like quantum flux, wave patterns, and energy exchanges; theories on consciousness and its role in interpreting energy and information within organisational contexts; the mind-body-spirit triad and its implications for organisational behaviour, redefining spirituality as a combination of energy and information; and an analysis of traditional and contemporary management models, identifying gaps in addressing modern organisational complexities.

Following the literature review, the paper integrates these theoretical insights into a comprehensive framework for quantum-informed management. This involves synthesising Heim's Unified Field Theory with management principles and incorporating quantum physics concepts into organisational behaviour studies. The proposed management model will be based on the mind-body-spirit triad, incorporating energy and information flows, consciousness-driven decision-making, and nonlinear interactions. The implications for organisational culture will be explored, including potential transformations in leadership styles, teamwork dynamics, and overall organisational effectiveness.

The conclusion will summarise the study's key findings and contributions, discussing how the proposed framework advances the theoretical and practical understanding of organisational behaviour. It will also highlight the benefits of integrating spiritual well-being into organisational effectiveness and culture and suggest directions for future research to refine further and expand the framework. Following this structured approach, the paper aims to systematically build a conceptual framework that merges quantum physics and management principles, ultimately proposing a novel model for understanding and enhancing organisational behaviour and culture.

Literature Review

The Concept of the Observer in Physics

In physics, the concept of the observer is paramount, particularly within the framework of quantum mechanics. An observer is defined as an entity that interacts with a physical system to gain information about its state. This interaction is not merely passive; it has profound implications for the observed system. The observer effect refers to the phenomenon where the act of observation influences the system being observed (Sassoli de Bianchi, 2013). The role of the observer is complexly tied to the principle of measurement in quantum mechanics, a principle that challenges the classical notion of

objective reality.

Heisenberg's (1949) uncertainty principle encapsulated the essence of this challenge. According to Heisenberg (1949), the act of measuring certain pairs of physical properties, such as position and momentum, inherently limits the precision with which these properties can be known. This principle implies that the observer plays an active role in defining the properties of the quantum system, leading to the concept of wave function collapse (Sokolovski, 2020). Upon measurement, the wave function—a mathematical description of the quantum state—collapses into a definite state, making the observer an integral part of the physical process.

This idea is further explored in the thought experiment known as Schrödinger's cat, which illustrates the paradoxes associated with quantum measurement and the role of the observer (Monroe et al., 1996). In this experiment, a cat in a sealed box is simultaneously alive and dead until an observer opens the box and observes the cat's state. This paradox underscores the significance of the observer in determining the state of a quantum system, highlighting the interplay between observation and reality (Schrödinger, 1935).

The Nature of Consciousness

The earliest work on consciousness is based on Freud's (1900) model of the mind, which divides consciousness into three distinct levels: conscious, preconscious, and unconscious, each with specific roles and functions. The conscious mind includes all thoughts, memories, feelings, and wishes that we are aware of at any given moment. This level allows for rational thought and deliberate action, encompassing the mental processes we can actively think about and discuss. Additionally, the conscious mind holds our immediate awareness and the capacity to retrieve information from memory easily. The preconscious mind consists of elements not currently in the conscious mind but can be brought into awareness readily, such as memories and knowledge that are not actively thought about but are accessible when needed. It acts as a bridge between the conscious and unconscious minds, facilitating information flow and retrieving relevant data. In Freud's (1900) model, the unconscious mind is a reservoir of feelings, thoughts, urges, and memories outside of our conscious awareness. This level contains repressed elements that are often unacceptable or unpleasant, influencing behaviours and experiences without our direct awareness. Understanding these levels of consciousness is crucial for organisational behaviours, as the conscious mind's ability to process information rationally is key for decision-making. In contrast, the preconscious mind integrates past experiences into problem-solving efforts.

Jung (1936) expanded on Freud's (1900) model by introducing additional layers and concepts. While Jung's (1936) conscious mind includes thoughts and perceptions individuals are aware of, similar to Freud (1900), Jung (1936) placed more emphasis on the ego's role in maintaining a sense of identity. The personal unconscious contains memories and thoughts that have been forgotten or repressed, akin to Freud's (1900) concept of the unconscious. However, Jung's (1936) introduction of the collective unconscious marked a significant divergence. All humans share this more profound level of the unconscious, which consists of archetypes and universal symbols, adding a new dimension to understanding the unconscious mind (Jung, 1968). Key differences between Freud's (1900) and Jung's (1936) theories include the scope of the unconscious, the nature of unconscious content, and the function of the unconscious. Freud (1900) focused

on the personal unconscious composed of repressed memories and desires specific to the individual, while Jung (1936) added the collective unconscious containing universal human experiences. Freud (1900) emphasised repressed desires, particularly sexual and aggressive instincts, whereas Jung introduced archetypes and a broader range of instincts and experiences. Freud (1900) saw the unconscious primarily as a repository of repressed desires influencing behaviours, while Jung (1936) viewed it as a complex interplay of personal and collective elements contributing to personal growth and individuation. These differences underscore the rich complexity of human consciousness and the various ways it has been interpreted within psychology (Freud, 1900; Jung, 1968).

Chalmers' (1997) seminal work, "*The Conscious Mind: In Search of a Fundamental Theory"*(1997), delves into the complex nature of consciousness, presenting a comprehensive analysis that challenges the materialist perspective prevalent in contemporary science. Chalmers (1997) argued for a dual-aspect theory of information, positing that conscious experience cannot be fully explained by physical processes alone and introduced the concept of the 'hard problem' of consciousness, which concerns the question of why and how physical processes in the brain give rise to subjective experience.

Chalmers (1997) distinguished between two types of problems in the study of consciousness: the 'easy problems' and the 'hard problems'. The easy problems involve explaining cognitive functions and behaviours, such as perception, memory, and decision-making, which can be addressed through standard scientific methods. In contrast, the hard problem pertains to the nature of subjective experience itself, which Chalmers contends cannot be reduced to physical processes.

Central to Chalmers' (1997) argument is the idea of 'phenomenal consciousness', which refers to the qualitative aspects of experiences—the 'what it is like' to have a particular experience. Chalmers (1997) suggested that these qualitative aspects, or qualia, are fundamental and irreducible components of reality. To address the hard problem, Chalmers (1997) proposed a form of property dualism, where consciousness is viewed as a fundamental aspect of the universe, akin to space, time, and mass. Chalmers (1997) also explored the implications of his theory for understanding the mind-body problem. He argues that if consciousness is indeed a fundamental property, it necessitates a re-evaluation of the physicalist ontology that dominates much of contemporary science. This re-evaluation would involve integrating consciousness into the basic framework of the world, potentially through new scientific paradigms that recognise consciousness as a fundamental constituent of reality. In summary, Chalmers (1997) offered a profound critique of reductionist approaches to consciousness and advocated for a fundamental theory that acknowledges the irreducibility of subjective experience. Chalmers' (1997) work underscores the necessity of addressing the hard problem of consciousness and proposes a dual-aspect theory of information as a potential pathway to understanding the profound nature of conscious experience.

Recent studies on consciousness and reality perception further elaborate on these foundational theories. Research by Koch et al. (2016) on neural correlates of consciousness (NCC) identifies specific brain regions and neural mechanisms associated with conscious experience. This research highlights the role of the prefrontal cortex, the posterior parietal cortex, and the temporoparietal junction in integrating sensory information and sustaining awareness. These findings align with Freud's (1900) emphasis on the conscious mind's role in processing and rationalising experiences but extend the

understanding by pinpointing specific neural pathways involved in these processes.

In summary, while Freud (1900) and Jung (1936) laid the groundwork for understanding the structure and function of consciousness, recent neuroscientific studies provide detailed insights into the neural correlates of consciousness and the mechanisms by which the brain constructs reality. These contemporary findings enhance our understanding of the interplay between conscious awareness, unconscious processes, and the brain's predictive capabilities, bridging the gap between early psychoanalytic theories and modern cognitive neuroscience.

Interfacing Consciousness with Higher Dimensions

> *The conceptual mind, then, can never grasp a reality independently of thought, and the five senses clearly cannot penetrate beyond the veil of sensory appearances. The only possible access we may have to phenomena that transcend human concept and sensory perception is by cultivating state of awareness that themselves transcend language, concepts, and sensory experience (Wallace, 1996, p. 16).*

While hard science traditionally excludes elements that cannot be empirically verified, such as spiritual or philosophical constructs originating from human consciousness, an intriguing intersection exists between consciousness and higher dimensions. This intersection is particularly relevant in theoretical physics, cognitive science, and psychology, where interdisciplinary approaches can provide deeper insights.

One area of exploration is the potential connection between physiological processes in the human brain and non-material principles of consciousness. Neuroscience research has shown that certain cognitive functions, such as spatial awareness and abstract thinking, involve complex neural networks that can be influenced by various factors, including sensory inputs and mental states (Pulvermüller et al., 2021). This suggests that the brain's processing of spatial information might be more flexible and expansive than previously thought, potentially allowing for a conceptual understanding of higher dimensions (Gardenfors, 2004).

In psychology, the study of altered states of consciousness—induced by meditation, psychedelic substances, or other means—has revealed that individuals can experience perceptions of higher-dimensional spaces (Fradkin, 2024). These experiences, while subjective, offer valuable insights into the nature of consciousness and its potential to interface with dimensions beyond the immediate physical world (Wallace, 2010).

The interplay between the observer, consciousness, and awareness of different dimensions of space represents a rich and multifaceted area of academic inquiry. The observer's role in quantum mechanics underscores the active participation of measurement in defining reality. Consciousness, with its profound complexity, remains a central topic in understanding subjective experience and cognitive processes. As explored in string theory, awareness of higher dimensions challenges our conventional notions of space and provides a broader framework for understanding the universe (Greene, 2000). Interdisciplinary approaches that bridge these concepts can lead to new insights and a deeper comprehension of physical and mental realms.

Hoffman's (2008) "Conscious Realism and the Mind-Body Problem" offers a transformative perspective on the relationship between consciousness and physical reality. Hoffman's (2008) theory of conscious realism posits that consciousness is the fundamental component of reality and that what we perceive as the physical world is a construct created by conscious agents. This paradigm shift profoundly impacts the traditional mind-body problem, which seeks to understand how mental states, such as beliefs and desires, relate to physical states in the brain. Hoffman (2008) challenged the conventional physicalist view that consciousness arises from physical processes in the brain, suggesting instead that the physical world is an interface generated by consciousness. In this view, our perceptions function like a user interface on a computer screen, presenting only the information necessary for survival without revealing the underlying complexity. Consequently, the brain and its neural activities are seen as part of this interface rather than the source of consciousness.

This theory reconfigures the mind-body problem by reversing the traditional causal relationship between the mind and the body. If consciousness is primary and the physical world is derivative, the focus shifts from how consciousness arises from matter to how our experiences shape our perceptions of physical reality. This shift entails several significant implications. Ontologically, it suggests that consciousness is the foundational element of existence, challenging the reductionist approach that explains consciousness solely through neural mechanisms (Goff, 2017). Epistemologically, it implies that our understanding of the physical world is limited and shaped by the needs of conscious agents, aligning with the notion that scientific models and theories are tools for navigating experiences rather than revealing absolute truths about objective reality (D. Hoffman, 2008). Metaphysically, it posits that all experiences and phenomena, including time, space, and matter, are products of consciousness, necessitating a framework where interactions between conscious agents form the basis of reality (Bergonzi & Luisi, 2017).

Hoffman's (2008) theory also has an interdisciplinary impact, potentially bridging gaps between quantum mechanics, cognitive science, and philosophy of mind. Centering consciousness in the framework encourages interdisciplinary research to understand reality's informational and relational aspects. Empirical research, such as studies in quantum mechanics on the observer effect and cognitive science on perception, supports the idea that conscious agents construct their perceived realities. However, the theory faces criticisms, including the lack of direct empirical evidence that consciousness is the fundamental building block of reality and challenges in explaining how individual subjective experiences arise from universal consciousness.

In conclusion, Hoffman (2008) proposed radically rethinking the relationship between consciousness and physical reality. By suggesting that consciousness is fundamental and the physical world a construct of conscious agents, Hoffman (2008) provided a novel approach to the mind-body problem with far-reaching implications for ontology, epistemology, metaphysics, and interdisciplinary research. Nonetheless, further empirical support and theoretical refinement are needed to address the challenges and criticisms of this innovative theory.

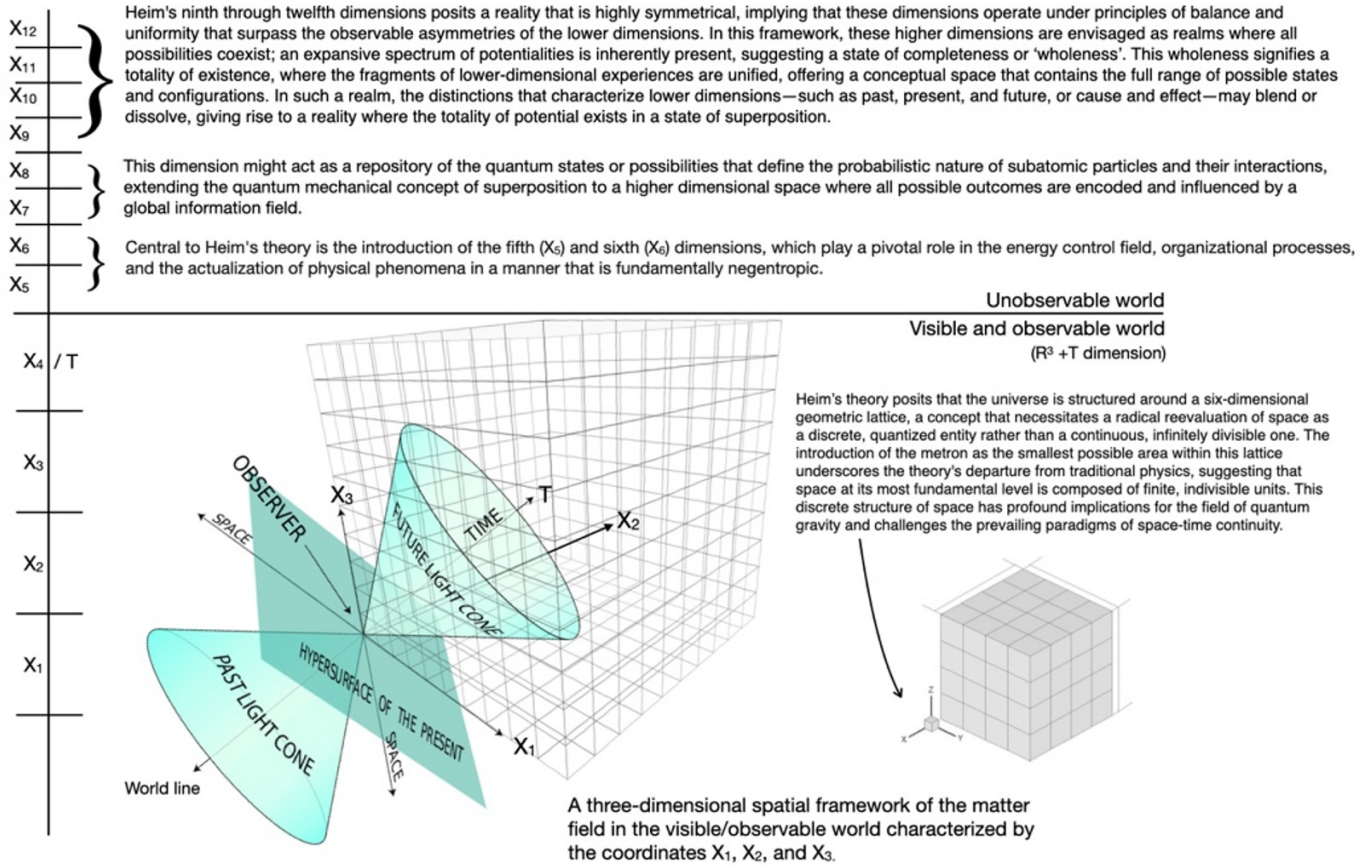

Figure 1. Re-contextualized illustration of Heim's12-dimensions (Leong, 2024b)

Theoretical Foundations of Heim's Unified Field Theory

At the core of Heim's Unified Field Theory is the proposition that the universe operates in more than the four observable dimensions of spacetime. Heim's (1999) original model included six dimensions but subsequently postulated a 12-dimensional framework, where additional dimensions are required to fully describe the interactions and properties of fundamental particles and forces. Figure 1 illustrates the 12 dimensions reinterpreted by (Leong, 2024b)**.** One of the primary objectives of Heim's (1999) Unified Field Theory is to unify the fundamental forces: gravitational, electromagnetic, weak, and strong nuclear forces. Heim suggests that these forces can be described as different aspects of a single fundamental interaction within a multi-dimensional space. This perspective is akin to the goals of string theory and other grand unified theories, which also seek to describe all forces and particles within a single theoretical framework. However, Heim's (1999) approach is distinctive in its geometric interpretation, where the properties and interactions of particles are derived from the curvature and topology of the higher-dimensional space. This geometric foundation allows for a novel explanation of how different forces emerge from the same underlying structure.

The schematic representation of Heim's 12-dimensional framework, as depicted in Figure 1, provides a detailed mapping of the universe, divided into distinct yet interconnected dimensions. Heim's (1999) theoretical exploration into unifying the universe's fundamental forces starts with the familiar three-dimensional spatial framework, augmented by a temporal dimension collectively known as R^4 (X_1, X_2, X_3, X_4). Heim proposed that a complete unification theory necessitates

extending beyond this four-dimensional spacetime continuum. This is the realm of empirical experience, where phenomena are directly perceivable through sensory input and measurable by scientific instruments. Figure 1 situates the observer within this domain. The observer is traditionally positioned within the four-dimensional framework comprising the observable universe. This framework, denoted as dimensions X_1 through X_4, includes the three dimensions of space plus one dimension of time. In this context, the observer operates at the intersection of these dimensions, utilizing the faculties necessary to perceive and interpret phenomena within this four-dimensional continuum. In the spacetime framework, the observer's role is closely associated with the concept of light cones. Light cones are spatial-temporal geometrical representations that define possible future and past events, all constrained by the speed of light (Christensen, 1981; Heydenreich, 2021). These cones outline the causal structure of spacetime, indicating which events can potentially influence or be influenced by others.

Heim (1999) introduced a six-dimensional space R^6 to reconcile gravitational and electromagnetic forces with weak and strong nuclear forces, positing these six dimensions as essential for encapsulating the four known fundamental interactions governing the physical universe.

Heim's (1999) progression to an eight-dimensional framework (R^8) was driven by the need to account for the nuanced interactions between subatomic particles. In Heim's framework, dimensional space is not merely a mathematical abstraction but is posited to have tangible correspondence with real-world phenomena. The six-dimensional world (R^6) introduces two additional organisational dimensions, entelechial[3] and aeonic[4], which are instrumental in the formation and stabilization of structures, countering the entropic tendency towards disorder. These dimensions, transcending traditional notions of space and time, introduce the concept of a life force that acts as a neg-entropy, imposing order and structure within the physical world. Further extending this framework, Heim's (1999) eight-dimensional model (R^8) incorporates informational dimensions that underpin the structured reality, suggesting that the material world is shaped by underlying informational 'programs'. This model aligns with esoteric and metaphysical conceptions of an astral world of organisational principles and a mental world of ideas and abstract concepts, indicating a universe where information plays a critical role in manifesting physical reality. Ultimately, Heim postulated a twelve-dimensional universe (R^{12}), introducing four additional dimensions (G^4) for mathematical completeness. Although these dimensions remain elusive regarding their physical interpretation, they are theorised to transcend energy as we understand it, hinting at a profound regulatory mechanism underlying the cosmos. Heim's (1999) exploration of multidimensional spaces through wave theory, information theory, and quantum theory provides a sophisticated framework for understanding the universe's fundamental structure. This approach, emphasising informational and organisational dimensions beyond the physical, resonates with contemporary discussions on the mind-body-spirit connection, suggesting a universe where information and energy converge to shape reality's fabric and matter's emergence. Applying Heim's (1999) theories to management science, particularly through analogical and metaphorical approaches, hints at the potential for these theoretical insights to inform our understanding of organisational behaviours, influenced by the invisible dimensions of information and organisation that Heim delineates.

Heim's (1999) theoretical advancements, which extend the conventional spacetime model to encompass additional dimensions for unifying the fundamental forces, intriguingly align with principles from quantum field theory (QFT) and

quantum information theory (QIT). Heim's (1999) expansion to a multi-dimensional universe, including six-dimensional (R^6) and eventually twelve-dimensional (R^{12}) spaces, aims to integrate gravity, electromagnetism, and the nuclear forces within a singular framework. This endeavour resonates with QFT's objective to describe particles and their interactions through fields extending across space and time, offering a quantum mechanical description of all fundamental forces except gravity.

Quantum field theory, particularly through the Standard Model, has successfully described electromagnetic, weak, and strong nuclear interactions. However, the integration of gravity remains elusive, a challenge Heim sought to address through his multidimensional approach. Adding organisational and informational dimensions to Heim's (1999) model (S^2 and I^2, respectively) introduces a conceptual framework that parallels aspects of quantum information theory. QIT explores the quantum mechanical properties of information, suggesting that information is not merely an abstract entity but has physical qualities and can be quantified and manipulated according to quantum mechanics.

The entelechial and aeonic dimensions proposed by Heim, governing organisational structure formation and dynamic stability, can be conceptually likened to the information fields described in QIT. These fields, characterised by quantum entanglement and superposition, underpin the non-local interactions and the probabilistic nature of quantum systems, suggesting a universe where information is a fundamental component of physical reality.

Moreover, Heim's (1999) later exploration into an eight-dimensional model (R^8) to account for particle interactions further aligns with the core tenets of QFT, where fields are the fundamental entities, and particles are excitations of these fields. The informational dimensions (I^2) in Heim's framework can be associated with the quantum informational perspective, where information about the state of a system is fundamental to its physical description.

While Heim's Unified Field Theory offers a compelling theoretical framework, its empirical validation remains a significant challenge. The theory's predictions, particularly those involving higher dimensions, require experimental verification that is currently beyond the reach of existing technology. Nonetheless, Heim's (1999) work has inspired numerous theoretical and experimental inquiries into the nature of higher dimensions and their role in unifying fundamental forces.

Discussion

Table 1. Re-interpretation of Heim's Theory with Implications from Management Science Adapted from (Leong, 2024b)

	Heim's Theorization	X	Re-contextualized Interpretation of Heim's Theory of 12-Dimensional World	Implications for Management Science
R^3	A three-dimensional spatial framework characterised by the coordinates X_1, X_2, and X_3.	X_1		Transposing the concept of an unseen dimension from theoretical physics and cosmology to the field of management science offers a thought-provoking metaphor for examining the underpinnings of organisational dynamics and strategic management. This metaphorical application posits that, just as the physical universe may be shaped by dimensions beyond our
		X_2		
		X_3		

				conventional perception, the operational realities of organisations are influenced by underlying, often intangible, factors that dictate their structure, performance, and evolution. This unseen dimension within organisations can be conceptualised as encompassing the complex interplay of organisational culture, unseen market forces, implicit knowledge, and the unarticulated values and beliefs that guide decision-making processes (Marshak, 2006). Though not directly observable, such elements significantly impact the organisation's strategic orientation and operational efficacy through their interdependent interactions in the complex system. Drawing from the principles of complexity theory, Stacey (1995) suggested that the dynamics of complex systems in organisations emerge from patterns of interaction that are not fully visible or understood, implying a hidden dimension to organisational behaviour and change. Moreover, this perspective aligns with the notion of 'deep structure' in organisations, as proposed by Gomez and Jones (2000), who argued that beneath the surface of observable organisational phenomena lies a deeper layer of core assumptions, values, and beliefs that shape the essence of organisational culture. These underlying dimensions, though elusive, play a critical role in shaping organisational identity, guiding behaviour, and influencing strategic outcomes. In strategic management, acknowledging an unseen dimension parallels the understanding that latent forces, including tacit knowledge, unspoken rules, and the organisational subconscious, often guide strategic foresight and decision-making. This aligns with Harrison and Shirom's (1998) view on strategy formation as a pattern in a stream of decisions, suggesting that the genesis of strategic direction is often rooted in the confluence of explicit planning and the implicit guiding principles that emerge from the organisation's collective experience and intuition. Investigating unseen dimensions within management science necessitates rethinking established paradigms, urging consideration of non-linear effects on organisational adaptability and success. This multidisciplinary inquiry, integrating psychology, sociology, and quantum physics, fosters a refined grasp of the dynamics underpinning organisational prosperity. The concept of unseen dimensions prompts a reassessment of the subtle yet potent
T	Dimension of time	T_1	This assertion posits that the physical universe, traditionally conceptualised within the framework of four dimensions—three spatial dimensions (R^3) and one temporal dimension (T^1), termed as observable universe, is shaped by an additional, unseen dimension. This paper argues that the observable universe (the materialisation space, R^3 +T) arises from the unseen higher-level dimensions (S^2, I^2, G^4). This proposition suggests that the tangible reality experienced and observed, governed by spatial and temporal parameters, is influenced or constituted by dimensions beyond conventional perception. Such unseen dimensions imply a fundamental layer of reality that interacts with or dictates the structure and dynamics of the physical world, potentially serving as a formative or organising principle that transcends observable dimensions which are influenced by the four main forces in the observable realm- gravity, electromagnetism, strong nuclear forces and weak nuclear forces. The four fundamental forces exhibit significant variations in both their range and magnitude. Furthermore, this perspective resonates with philosophical and theoretical discussions on the nature of reality and the limits and capacity of human perception (Carbon, 2014). It raises profound questions about the completeness of our understanding of the universe, suggesting that what we perceive as the physical world may be influenced by forces or dimensions that elude direct observation. This unseen dimension could encapsulate forces, principles, or entities that play a crucial role in the formation and evolution of the universe, offering a potential bridge between empirical science and theoretical models that seek to explain the complexities of the cosmos beyond the conventional four-dimensional space-time continuum.	

				a reassessment of the subtle yet potent factors that shape organisations, advocating for a holistic recognition of the complexities inherent in organisational life and catalysing novel research and managerial practices.
		X_5	The concept of X_5 pertains to an entelechial force that imparts form and direction, facilitating the actualisation of potential within organisational structures. It represents the intrinsic, formative energy that drives the emergence and maintenance of order and complexity in organisational contexts. Entelechial force is a term derived from Aristotelian philosophy referring to an intrinsic form-giving cause that drives the actualisation of potential (Logan, 1897). This entelechial force is instrumental in the genesis and maintenance of organisational structures within biological entities. It represents a principle fundamentally inverse to that of entropy, which is characterised by the tendency of systems to move towards disorder and randomness (Clayton, 2004). The entelechial force, by contrast, fosters order, complexity, and organisation, thereby enabling the development and sustenance of biological life (Wachbroit, 1994). The significance of such a force in biological contexts can be elaborated upon by drawing upon concepts from developmental biology and systems biology. For instance, in the process of morphogenesis—the biological process that causes an organism to develop its shape—entelechial principles can be seen at work. Here, genetic and epigenetic factors function as form-giving causes, guiding cells' spatial and temporal organisation into complex tissues and organs (Malabou, 2016). This process exemplifies how biological systems inherently counteract entropy through regulated patterns of growth and differentiation, thereby maintaining and increasing organisational complexity. Furthermore, the concept of homeostasis, the self-regulating process by which biological systems maintain stability while adjusting to conditions that are optimal for survival, can be viewed as an expression of the entelechial force (Collins, 1984). Through homeostatic mechanisms, living organisms demonstrate an intrinsic capacity to orchestrate physiological processes in a manner that preserves order amidst	In practical terms, applying the transcoordinate concept in organisational science can enhance our understanding of how organisations evolve, adapt, and maintain coherence in the face of environmental changes and internal challenges. It suggests that effective organisational design and management must account for both structure and strategy's immediate, form-giving aspects (X_5) and the longer-term considerations of adaptability, resilience, and sustainability (X_6). The concept of the entelechial force, designated as X_5 in the context of management science, illuminates a pivotal principle in the orchestration of organisational dynamics. Drawing from Aristotelian philosophy, where it is posited as an intrinsic formative cause that propels the actualisation of potential, this concept finds a compelling parallel in the management of organisational structures. It embodies the internal, driving energy catalysing an organisation's emergence and sustenance of order and complexity. It is a counterbalance to the entropic forces that incline systems towards disorder and randomness. Applying the entelechial force concept in management science can be likened to the strategic and operational mechanisms that guide organisations towards achieving their latent potential. Analogous to the biological process of morphogenesis, where genetic and epigenetic factors serve as formative causes to shape organismal structures, organisational strategies and structures act as the genetic blueprint for corporate evolution. These strategies delineate how organisations navigate growth, adaptation, and complexity management. As noted by Wheatley (2011), organisations thrive on complexity and order, necessitating a formative blueprint that directs their evolutionary trajectory. Moreover, the principle of homeostasis in biological systems, which ensures stability amidst changing environmental conditions, mirrors the organisational need for adaptability and resilience (Leong, 2023). Leong's (2023) 'organisational homeostasis' employs homeostatic mechanisms through adaptive leadership and change management practices to maintain organisational stability while flexing to external pressures. This adaptive capacity is crucial for organisational longevity and

			processes in a manner that preserves order amidst environmental fluctuations. Additionally, the theory of autopoiesis provides a contemporary framework for understanding the entelechial force in biological life (Lyon, 2004). Autopoiesis describes how living systems are self-creating and maintain their identity through continuous renewal and repair processes, effectively counteracting entropy and ensuring the persistence of life. This theory underscores the dynamic interplay between structure and function within biological entities, driven by form-giving causes that actualize potential into organised, living systems. The entelechial force embodied by X_5 is pivotal for clarifying the genesis and progression of life. Counteracting entropy, X_5 clarifies how biological systems attain and preserve their intrinsic complexity and organisation. This notion broadens our understanding of biological processes and underscores the synergy between physical laws, biological imperatives, and philosophical inquiry in life sciences.	success, underscoring the management's role in balancing stability and flexibility (Senge, 1990). Furthermore, the theory of autopoiesis, highlighting the self-renewing nature of living systems, offers a metaphor for organisational innovation and sustainability. Biological entities renew and repair themselves to sustain life. Similarly, organisations must foster innovation and continuous improvement to thrive in competitive landscapes. This entails a dynamic interplay between an organisation's structure and operational functions, driven by the entelechial force of managerial vision and leadership that actualizes organisational potential (Maturana & Varela, 1991). In management science, therefore, the entelechial force transcends its biological origins to represent a critical element in the formulation and execution of strategic initiatives that imbue organisations with direction and purpose. It underscores the intrinsic capacity of organisations to evolve, adapt, and innovate in pursuit of their ultimate objectives, thereby maintaining order and complexity in the face of entropy. In conclusion, the concept of X_5 or the entelechial force in management science, exemplifies the intrinsic, formative energy that underpins organisational development and complexity. This perspective not only broadens our understanding of organisational dynamics but also bridges the gap between theoretical principles and practical applications in management, highlighting the multifaceted role of leadership in actualising potential and guiding organisations towards their envisioned futures.
S^2	2 organisational coordinates (X_5, X_6). S^2 is delineated through two organisational coordinates, referred to as X_5 and X_6, which collectively form a construct known as a 'transcoordinate'. The concept of a 'transcoordinate', encapsulating organisational coordinates X_5 and X_6, offers an advanced framework for understanding organisational dynamics beyond traditional spatial and temporal dimensions.			The concept of X_6, characterised by its aeonic nature, introduces a vital perspective to management science, emphasizing the significance of long-term dynamic stability and adaptability in organisational structures. This concept aligns with the temporal aspects of evolutionary biology, underscoring the importance of enduring through time, adapting, and evolving to ensure sustainability. In management, the aeonic attribute mirrors the strategic foresight necessary for organisations to navigate through temporal transformations and maintain relevance over extended periods. Drawing parallels with evolutionary biology, where long-term adaptability and survival are contingent upon the ability to respond to environmental pressures over aeons, organisations must evolve strategies that

		X_6	On the other hand, X_6, characterised as aeonic, governs these structures' long-term dynamic stability and adaptability, steering them through temporal transformations and ensuring their sustainability over extended periods. This re-contextualized interpretation suggests that X_6 operates within the temporal dimension, identified as a time coordinate in system S. The aeonic characteristic denotes a temporal process extending beyond immediate equilibrium, targeting enduring viability and flexibility, thereby emphasizing biological systems' evolutionary and developmental dimensions. This notion of aeonic guidance resonates with the principles of evolutionary biology, where the temporal dimension is crucial for understanding the adaptation and survival of species (Pearson, 2002). Over aeons, evolutionary pressures shape organisms, guiding them towards configurations that are not only stable but also conducive to reproduction and survival in fluctuating environments (Skinner, 1984). This process can be seen in developing complex adaptive systems, where biological entities evolve mechanisms for resilience and homeostasis that ensure their continuity over geological timescales (Laughlin, 2023). The aeonic principle, which underscores the importance of long-term stability and adaptability, plays a critical role in elucidating the processes of ecosystem succession and the developmental trajectories of organisms. This principle articulates the gradual evolution of ecosystems from lower complexity to higher complexity, alongside the ontogenetic development of organisms that progresses from the zygotic stage to full maturity, an intricately regulated process by genetic and epigenetic factors over temporal spans. Furthermore, this principle is evident in cellular mechanisms, including DNA repair and telomere maintenance, which are indispensable for preserving genetic integrity and promoting organismal longevity. In the context of X_6 characterisation, the aeonic principle highlights the integral role of temporal dimensions in biological evolution, organismal development, and the sustenance of dynamic homeostasis, thereby providing a foundational perspective for understanding the complexities of life from molecular to ecosystem levels.	ensure their viability in changing market conditions and competitive landscapes. The aeonic principle in management science thus represents the strategic planning and developmental processes that guide organisations towards achieving sustained success and resilience. Tushman and O'Reilly (1996) highlighted organisations must engage in continuous adaptation and strategic renewal to thrive in dynamic environments. Similarly, the ecological concept of successional dynamics, which describes the progressive evolution of ecosystems towards mature, stable states, offers a metaphor for organisational growth and transformation. Ecosystems evolve through stages of complexity; similarly, organisations undergo phases of development, from nascent startups to mature entities. This transformation requires a balance between exploiting existing competencies and exploring new opportunities, ensuring long-term sustainability amidst fluctuating environmental conditions (Levinthal & March, 1993). Furthermore, the aeonic perspective can be applied to organisational ontogeny, mirroring the biological development from zygote to adult. From their inception to maturity, organisations experience growth and adaptation phases guided by genetic (foundational strategies and values) and epigenetic (cultural and structural adaptations) factors. This developmental trajectory necessitates maintaining stability while accommodating growth and environmental demands; a process echoed in the principle of ambidexterity in organisational theory, which advocates for the simultaneous pursuit of exploitation and exploration (O'Reilly & Tushman, 2013). Moreover, the aeonic concept resonates with the importance of mechanisms akin to DNA repair and telomere maintenance in organisations. Biological processes ensure the longevity and stability of cells. Similarly, organisational learning and innovation mechanisms act to repair and rejuvenate the corporate genome, enabling adaptation and longevity in the corporate landscape. This analogy underscores the critical role of continuous learning, innovation, and adaptation mechanisms in maintaining organisations' dynamic stability and long-term viability. In conclusion, the aeonic principle enriches management science by providing a comprehensive framework for understanding the temporal dynamics essential for organisations' long-term sustainability and

				adaptability. By integrating this temporal dimension, management science gains insights into the strategic and operational imperatives that ensure organisations survive and thrive over time, reflecting the complex interplay between stability and change.
			X_7 is posited as emblematic of a universal information field, encapsulating all conceivable information about the universe's constituents, thus shedding light on the essential principles underpinning existence. This discourse advances the proposition that the operational mechanics of the universe transcend mere physical laws, extending into the domain of informational principles, thereby enabling consciousness to engage directly with the primordial informational constructs of reality. This raises pertinent inquiries regarding the interplay between human conscious processing and its preconscious and unconscious counterparts. Navon (1991) delineated conscious processing as an act of focused attentiveness, necessitating voluntary engagement and constituting a fundamental element in learning, stimulus-response (as observed within the 'X_1, X_2, X_3 and T_1' spacetime), and the orchestration of complex, innovative responses, especially pertinent to planning and reflective processes. The argument herein posits that dimensions X_7 and X_8 are where the preconscious and unconscious processing mechanisms are situated, suggesting a layered and nuanced interaction model between different levels of cognitive processing and the universal information matrix. This conceptual framework challenges traditional scientific paradigms and invites a multidisciplinary exploration into the confluence of information theory, consciousness studies, and physics to unravel the complex dynamics at play between cognitive processes and the informational underpinnings of the cosmos. I^2 informational field posits a more intricate architecture of consciousness, where intuition, preconscious, and unconscious mechanisms are essential elements of a vast informational network. This expanded framework allows for a deeper understanding of how these mechanisms contribute to the emergence of conscious experience, emphasizing the importance of considering the entire spectrum of cognitive processing in discussions of consciousness. Such a perspective is echoed in quantum physics and consciousness studies, which postulate the existence of a unified field of information integral to the fabric of reality. This concept resonates with Bohm's (2002) description of 'wholeness' and underscores the interconnectedness within the universe, where every element is part of a vast informational network. Bohm's (2002) holomovement is a concept derived from the holistic interpretation of quantum mechanics, proposing that reality is an undivided wholeness in constant flux—a dynamic process rather than a static state. Bohm (2002) envisioned a deep underlying order of existence, characterised by a complex level of interconnectedness, where each part of the universe contains information about the whole, much like in a	The concept of X_7, a universal information field encompassing all information about the universe's constituents, provides a profound analogy for understanding contemporary management science. This dimension's portrayal of a universe governed by informational principles rather than solely by physical laws mirrors the emerging paradigm in organisational theory and management that emphasises the critical role of information in shaping organisational dynamics and decision-making processes. In management science, the notion of an organisation as a system embedded within an extensive informational network reflects the complexity and interconnectivity of modern business environments. As Daft and Lengel (1986) proposed in their Information Richness Theory, the effectiveness of organisational communication depends on the richness of information channels, underscoring the importance of accessing and processing comprehensive informational inputs for decision-making. The analogy to X_7 suggests that just as the universe operates within a framework of informational constructs, so too do organisations navigate an environment where information is a pivotal resource, guiding strategy, operations, and innovation. The concept of a unified field of information, integral to the fabric of reality, parallels the insights from knowledge management and

I^2	The delineation of I^2 to encompass dimensions X_7 and X_8 posits that the structured reality of the physical world is fundamentally informed by informational constructs, suggesting that material phenomena are secondary to the primacy of informational patterns. Within this context, dimensions X_7 and X_8 are conceptualised as encoding the informational blueprints critical for the definition and behaviour of systems, while dimensions X_5 and X_6 contribute to their organisation and stability. This theoretical approach implies that the observable universe is a manifestation of underlying informational 'programs', highlighting the intertwined nature of organisational and informational realms. The proposition of an information-centric universe challenges conventional scientific views, advocating for an interdisciplinary synthesis incorporating physics, information theory, and consciousness studies. It underscores the necessity of recognising the informational underpinnings of reality to grasp the universe's complexity fully, advocating for a paradigm shift towards understanding the cosmos as an integrated, information-driven entity.	X_7	hologram. Therefore, this paper posits that within contexts of uncertainty, the nexus of information causality and consciousness converges at distinct, coarse-grained strata, catalysing the formation of a holographic projection of future possibilities that motivate agents towards action (Leong, 2024). This emergent holographic construct is theorized to arise from the interplay between consciousness and the coarse-grained, indeterminate information. This conceptual framework suggests that consciousness does not passively receive information but actively engages with it, particularly under conditions of uncertainty, to generate predictive models or representations of future states. This interaction underscores a critical aspect of human cognition: the capacity to navigate uncertainty by synthesising information into coherent, actionable future visions. The holographic imagery, artificial at this point as it is not realised yet, thus serves as a cognitive tool, enabling individuals to transcend the limitations imposed by immediate, concrete data and engage with a broader spectrum of possibilities (Leong, 2023c). This model intimates a deeper connection between consciousness and the informational structure of reality, wherein consciousness acts as a mediator or bridge, transforming abstract, uncertain information into tangible, motivational constructs. Furthermore, this hypothesis aligns with and extends current understandings of consciousness and information theory by suggesting that the human mind possesses an inherent ability to project and interact with potential futures through a holographic mechanism. Such a mechanism reflects a sophisticated form of cognitive processing that leverages the entangled relationship between consciousness and information, offering insights into the adaptive functions of consciousness in human decision-making and action initiation (Leong, 2023b). This perspective not only enriches the discourse on consciousness but also provides a novel lens through which to examine the dynamics of human cognition and its interface with reality's uncertain, probabilistic nature. The similarities between X_7 and Bohm's (2002) holomovement are striking. Both frameworks challenge the traditional, fragmented view of the universe, suggesting instead that the universe operates as a coherent and dynamic web of information. In Bohm's (2002) perspective, the apparent separation between objects is an illusion; at a deeper level, there is a continuous movement of information, which he refers to as the 'implicate order', where everything is connected to everything else (Bohm & Stapp, 1994). Likewise, X_7 is postulated to be an informational nexus, hinting at a model of reality where separateness is an emergent property rather than an ontological given. The notion that each universe's constituent is an integral part of a vast informational network suggests a reality where the relationships between entities are as fundamental as the entities themselves. This is akin to Bohm's (2002) assertion that in the implicate order, individual elements of reality are enfolded within the total order, and the unfolding of this information into the explicate order—our perceived reality—constitutes the process of becoming. These concepts have profound implications for our understanding of the cosmos, as they both offer a vision of reality where the flow of information is central to the fabric of	organisational learning disciplines. Nonaka and Takeuchi's (2009) theory of organisational knowledge creation emphasises transforming tacit knowledge into explicit knowledge within organisations, highlighting the dynamic interplay between different types of information and their role in fostering innovation and competitive advantage. This resonates with the interconnectedness described in X_7, where every element within the universe—or, in this case, the organisation—is part of a comprehensive informational network, contributing to the system's overall knowledge and capabilities. Furthermore, applying quantum physics principles to management science, as explored by Zohar (1997), who draws parallels between quantum mechanics and organisational behaviour, provides a direct link to the discussion of X_7. Zohar's (1997) work suggests that organisations, like quantum systems, are characterised by uncertainty, potentiality, and interconnectedness, necessitating management approaches that are flexible, adaptive, and informed by a deep understanding of the informational underpinnings of organisational reality. In summary, the conceptual framework offered by X_7, emphasising a universal information field and the operational dynamics governed by informational principles, provides valuable insights into management science. It encourages a re-evaluation of traditional management theories and practices in light of the complexities of the information age, advocating for approaches that recognize the centrality of information in shaping organisational realities. This perspective enriches the theoretical foundations of management science and provides practical guidance for navigating the increasingly interconnected and information-driven business landscapes.

		reality where the flow of information is central to the fabric of existence. They provide a framework for interpreting the mysteries of quantum physics and those of consciousness and reality itself.	
	X_8	Dimension X_8, on the other hand, emphasises organisational structures' dynamic and ever-evolving nature, driven by the continuous interplay between these informational fields and material reality. It reflects the adaptive and self-organising capabilities inherent to biological systems, which evolve in response to environmental pressures and internal regulatory mechanisms. This dimension underlines the process of 'actualisation', where the informational 'programs' encoded within X_7 and X_8 guide the development and adaptation of life forms and structures. This model suggests that the structured and ordered reality experienced in the physical world is underpinned by informational constructs or 'programs' that dictate the emergence and development of life forms, structures, and entities based on specific sets of information inherent to these dimensions. The proposition that X_5 and X_6 must coexist alongside X_7 and X_8 in this informational schema implies a deeply interconnected framework where physical and informational realms are inextricably linked. X_5 and X_6, representing the organisational forces that counteract entropy and guide systems toward stability, complement X_7 and X_8's role in encoding the informational blueprints that determine these systems' very nature and dynamics. This indicates that the material world, with its myriad forms and structures, is not merely a random assembly of matter but a manifestation of underlying informational programs that guide its organisation and evolution. The idea that the complete information pattern of any creature or process is embedded within the higher informational fields of X_7 and X_8 offers a profound insight into the mechanisms of biological diversity and complexity. It suggests that every organism or process in the natural world operates according to a specific informational 'program' encoded (Roederer, 2003) within these dimensions, which dictates its form, function, and interactions within the ecosystem. This perspective aligns with concepts in systems biology and theoretical physics, where the notion of information plays a critical role in understanding the fundamental principles that govern life and the universe at large (Stonier, 2012). The idea of an all-encompassing information field resonates with theories in quantum physics and consciousness studies (Glattfelder, 2019b), which explore the possibility of a unified field of information underlying the fabric of reality. It implies interconnectedness and coherence within the universe, where every particle, entity, and process is interlinked through informational exchanges that span the cosmos (Laszlo, 1995). According to the conceptualisation of X_7 and X_8, engaging with this information field could offer insights into the fundamental principles of existence, the dynamics of natural processes, and the intricacies of life itself. It suggests a framework where knowledge and understanding are not solely the products of empirical observation and experimentation. Still, it can also be derived from direct interaction with the foundational informational constructs of the universe. This perspective opens up new avenues for exploring the	In the discourse of management science, the concept of X_8, focusing on the dynamic and constantly evolving nature of organisational structures, aligns with theories of adaptive systems and organisational change. X_8's depiction of organisations as entities subject to the flux of informational fields and material realities parallels the notion of organisations as complex adaptive systems (CAS). These systems are characterised by their capacity to evolve in response to environmental stimuli and internal regulatory processes (Rammel et al., 2007). Corris (2022) posited that a CAS is a complex network of interconnected agents acting in an environment that feeds back into their behaviours and subsequent adaptations. The idea of actualisation, as presented in X_8, is reflected in the concept of organisational learning, where organisations are seen as dynamic entities that continuously adapt through learning mechanisms. Mikalef and Gupta's (2021) theory of organisational learning, for instance, conceptualises organisations as possessing the inherent ability to detect and correct errors through information processing, facilitating their ongoing evolution and adaptation to changing circumstances. Furthermore, the concept of informational 'programs' within X_7 and X_8 that guide development and adaptation resembles Senge's (1990) work on systems thinking within organisations. Senge (1990) suggested that the key to organisational success lies in understanding and managing the complex web of interrelationships and patterns rather than merely reacting to individual events. This systems thinking approach is essential for 'actualisation', as it requires understanding the underlying structures and informational patterns that govern organisational behaviour. The X_8 in management science also resonates with the work of Prigogine and Stengers (1984) and Leong's (2023) organisational homeostasis on order out of chaos, which describes how systems self-organise and evolve into higher states of complexity when exposed to fluctuating environmental conditions. Leong's (2023)

			nature of reality, suggesting that the physical world we perceive and interact with is but one aspect of a more complex and information-rich cosmos. It challenges traditional notions of separateness and isolation in science, proposing instead a model of unity and integration, where every aspect of the universe is part of a grand informational network. The proposition of X_7 and X_8 enriches the dialogue on the intersection of physics, information theory, and consciousness, encouraging a multidisciplinary approach to understanding the universe. It invites scholars and researchers to consider the implications of an information-centric view of reality, where the boundaries between the physical and the informational are blurred, and knowledge extends beyond the empirical into the realm of direct informational interaction. By conceptualising the universe as a manifestation of underlying informational patterns, this framework provides a bridge between the physical and informational realms, offering new insights into life, organisation, and evolution processes. It invites a re-evaluation of traditional scientific paradigms, suggesting that a deeper understanding of the universe requires an integration of physical laws with the informational codes that orchestrate the cosmos's structure and dynamism.	organisational homeostasis theory clarifies the self-organising capabilities of biological systems, which can be analogised to organisational structures that adapt and self-organise in response to market forces, technological innovations, and internal dynamics. In summary, X_8 offers a valuable theoretical framework for understanding organisational dynamics, adaptability, and learning principles. By conceptualising organisations as complex, information-driven systems that undergo continuous adaptation and actualisation, this dimension provides a basis for applying biological systems and complexity theory concepts to management science, enriching the understanding of how organisations can navigate and thrive in an ever-changing environment.
		X_9	X_9, as delineated by Heim, introduces a sphere of reality where traditional energetic exchanges are not the primary constituents. Instead, this dimension may be characterised as 'spirit' in the mind-body-spirit triad and by forms of interaction or existence that current scientific methodologies cannot quantify or qualify using energy as a metric. Such a perspective aligns with theories that advocate for non-material forms of existence, suggesting that the universe encompasses more than can be captured by our current understanding of energy (LePoire, 2020).	The conceptualization of X_9, as delineated by Heim, presents a compelling paradigm shift by introducing a sphere of reality in which traditional energetic exchanges are not the foundational components. This dimension posits an arena where interactions or existences elude the quantifiable and qualifiable metrics traditionally applied by scientific methodologies, particularly those centred around 'spirit'. This discussion on the implications of such non-material forms of existence offers a profound basis for re-evaluating management science's theoretical and practical frameworks. The acknowledgement of X_9 necessitates a reorientation of management theories and practices towards acknowledging and integrating non-traditional, non-energetic interactions and existences like entanglement across distance. This perspective underscores the limitation of existing paradigms that rely heavily on tangible, measurable entities and invites a broader, more inclusive approach that considers the impact of intangible factors on organisational dynamics, strategy formulation, and decision-making processes. Integrating X_9 into management science could enrich the discipline by fostering a deeper understanding of complex organisational ecosystems, where unseen forces and non-energetic interactions potentially play crucial roles in shaping outcomes. This approach encourages

				managers and scholars to explore novel methodologies for navigating and influencing the multifaceted and often intangible elements contributing to organisational success. Furthermore, embracing the complexities introduced by X_9 aligns with the growing recognition of the importance of psychological, cultural, and social dimensions in management. It provides a theoretical foundation for expanding the scope of analysis and intervention beyond the physical and energetically quantifiable realms of meaning, perception, and collective consciousness within organisations.
		X_{10}	X_{10} extends this framework, suggesting that spatial relationships might differ fundamentally from our current geometric and physical understanding. The potential existence of X_{10} implies a reality where space is not necessarily a passive container for matter and energy but could have properties and influences independent of them.	X_{10} recognises organisational spaces' complexity and dynamic nature. This paper analogizes that the 'space' (in the R^3 and T) in which organisations operate—encompassing markets, industries, and internal environments—is not merely a backdrop but an active player with its dynamics and properties. This re-evaluation of spatial dynamics offers a critical challenge to conventional management theories that typically perceive the business environment as a static backdrop for organisational activities. Such theories often fail to account for the active role of the environment in shaping and being shaped by organisational behaviour. This paper posits that the environment is not merely a passive context but actively engages in and contributes to the emergence of organisational phenomena. This perspective necessitates a shift in managerial thought processes and strategic planning, recognising the environment as a dynamic participant in creating and evolving business landscapes. The notion that the environment plays a contributory role in emergent phenomena is supported by recent scholarly work. For example, Cunha and Cunha (2006) argued for a more nuanced understanding of organisational dynamics that acknowledges the co-creative interplay between organisations and their environments. This paper emphasises the need for management theories to incorporate the principles of complexity and emergence, highlighting how environmental factors can drive unexpected organisational outcomes. Applying this notion to management, we can consider the organisational space as a field defined by a complex set of interactions, influences, and information flows, echoing the views of Battiston et al. (2021), who argue that higher-order interactions often

				characterise the “real-world systems” (p.1093). Here, the ‘space’ of an organisation includes the dynamic relational ties and knowledge networks that shape its capabilities and strategies. Prigogine and Stengers (1984) discussed how systems evolve into more complex structures through the flux of energy and matter, paralleling how organisations develop through the assimilation and application of information. Wheatley’s (2006) exploration of leadership and organisational behaviour through the lens of complexity science illustrates this point, suggesting that the effective management of organisations necessitates an understanding of the intricate and often non-linear dynamics that characterise their information flow. This approach recognizes the active role of this ‘space’ in shaping organisational outcomes, the significance of information in organisational expansion, and the need for theories that accommodate the non-linearity and interconnectedness inherent in organisational dynamics.
G^4	Heim’s X_9, X_{10}, X_{11}, and X_{12} delineate realms beyond the conventional understanding of energy, proposing spaces where the concept of energy as it is known ceases to apply. These dimensions facilitate the creation of volumes, suggesting a radically different framework for understanding spatial relationships and the nature of reality. Heim clarifies the existence of highly symmetric, non-temporal structures within these dimensions that interact with the spatial cosmos through informational coordinates. This interaction allows for modifying events across time—past, present, or future—without direct relevance to human perception or conventional temporal constraints. The concept of dimensions, where energy is not a defining factor, yet volumes and structures exist and exert influence, challenges traditional physics paradigms and invites a re-evaluation of the fundamental principles that are believed to govern the universe. This re-evaluation extends to understanding space, time, and causality, suggesting a universe much more interconnected and information-driven than previously thought.	X_{11}	X_{11} introduces a profound paradigm shift in our understanding of reality by postulating the existence of domains dominated by highly symmetric, non-temporal structures. The theoretical framework of X_{11} also aligns with Karakostas’s (2012) relational interpretation of quantum mechanics, where the properties of quantum objects are not absolute but relational and context-dependent. Similarly, X_{11}’s non-temporal structures imply a relational aspect to the fabric of reality, where the properties of these structures depend on their interaction with the rest of the universe.	Heim’s introduction of X_{11}, with its highly symmetric, non-temporal structures, offers a transformative lens through which to view and understand the complexities of management science. By suggesting a reality where linear temporality is not fundamental, Heim’s framework aligns with innovative approaches in organisational theory that question the traditional, sequential understanding of organisational processes and decision-making. X_{11}’s postulate of a reality underpinned by non-temporal structures encourages re-evaluating how time, causality, and progress are understood within management science. It calls for a deeper exploration of how organisational dynamics' non-linear and relational aspects can inform more flexible and adaptive management strategies.
				Heim’s G4 realm introduces a paradigm shift in the conventional understanding of energy by delineating spaces where traditional energy concepts are rendered inapplicable. Instead, it posits the existence of informational fields that remain largely inaccessible and unobservable, particularly at the preconscious and unconscious levels. This discussion, therefore, intersects the scientific study of consciousness with Jungian psychology and contemporary management science, suggesting that a deeper understanding of consciousness can

Heim's reference to the regulatory and control mechanisms emanating from the G^4 area points to a conceptual framework where the cosmos is seen as a holistic entity, with its dynamics not solely dictated by observable physical forces but also by these higher-dimensional informational interactions.

Finally, X_{12} encapsulates the concept of a universal regulatory mechanism, a dimension from which the cosmos

inform and transform organisational strategies and decision-making processes.

From a scientific standpoint, the study of consciousness encompasses both the observable mental processes and those that occur beneath the threshold of awareness—what is known as the unconscious and pre-conscious levels. The pre-conscious represents information that is not currently in the focal awareness but can be readily brought to consciousness. At the same time, the unconscious contains processes and content that are typically inaccessible to the conscious mind without specific techniques or interventions.

Kihlstrom (1987) aptly noted that "the preconscious is what could be conscious, and the unconscious is what is ordinarily not conscious" (Kihlstrom, 1987, p. 1445).

Carl Jung expanded the concept of the unconscious to include a collective dimension, a shared reservoir of experiences and archetypes that transcend individual experience. Jung (1968) posited that "the collective unconscious...is not individual but universal; unlike the personal psyche, it has contents and modes of behaviour that are more or less the same everywhere and in all individuals" (Jung, 1968, p. 42).

In management science, manipulating and understanding information derived from the environment over time and space are fundamental to strategic planning and decision-making. As organisations operate within the R^3 (three-dimensional space) and T (time) dimensions, the capacity to access and utilise information from the unconscious levels could offer a richer, more comprehensive view of organisational challenges and opportunities.

Information perceptible within the 3-dimension of space and one dimension of time (R^3 and T^1) is typically constrained by the information acquisition capabilities inherent to the human sensory system. The quintet of human senses—sight, hearing, taste, touch, and smell—serve as the primary conduits through which individuals garner information from their environment. This sensory-derived information represents only a fraction of the vast array of information potentially available, suggesting that our conventional perception offers a restricted glimpse into the complexities of our reality. Consequently, this limitation prompts the consideration of alternative means to access a broader spectrum of information beyond the scope of our immediate sensory experience.

The G^4 realm, possibly alluding to a theoretical framework akin to Heim's theory

		X_{12}	itself may be orchestrated. This dimension could represent a complex informational network that underlies and dictates the evolution and behaviour of the universe, as suggested by Azarian (2022) and Bernal-Casas and Oller's (2023) 'it from bit' doctrine, where all physical phenomena are fundamentally informational in line with Wheeler's (2018) critical idea that all things physical are information-theoretic.

theoretical framework akin to Helm's theory, which proposes additional dimensions of reality, calls for re-evaluating how information is perceived and utilised within organisational structures from the unconscious level. This mirrors the G4 realm in consciousness studies, which may involve accessing information beyond the typical sensory and cognitive processing limits.

Meditative practices are increasingly recognised as tools for accessing these deeper levels of consciousness. Travis (2020) discussed how specific meditation practices are associated with specific changes in consciousness, suggesting that such practices might allow individuals to tap into pre-conscious and unconscious information.

This paper posits that management practices can benefit from incorporating meditative consciousness to navigate complex informational landscapes. Wheeler (2018) viewed all physical phenomena as informational. Wheeler's assertion that "every it—every particle, every field of force, even the spacetime continuum itself—derives its function, its meaning, its very existence entirely...from the apparatus-elicited answers to yes-or-no questions, binary choices" (Wheeler, 2018, p. 310), resonates with the idea of integrating higher-dimensional spaces in management practices.

Organisations can reconceptualise their strategies and operations by embracing a holistic approach that integrates the known physical universe with higher-dimensional spaces. This perspective encourages a view of the cosmos as an information-rich network, wherein non-temporal, symmetric structures are crucial for its regulation and evolution, extending the boundaries of conventional organisational theory and practice.

X_{12} further extends this conceptual framework by positing a universal regulatory mechanism, suggesting that the cosmos may be orchestrated from this dimension.

This paradigm underscores the informational underpinnings of the universe, proposing that a complex informational network dictates the evolution and behaviour of the cosmos.

In the context of management science, these theories illuminate the profound implications of informational dynamics on organisational and strategic management. Recognising the universe as fundamentally informational challenges traditional management theories and practices, urging a shift towards more adaptive, information-centric approaches. This perspective emphasises the strategic

				importance of harnessing and interpreting information as a resource and as a fundamental constituent of reality that shapes organisational environments and outcomes. Thus, exploring Heim's G4 realm and the X12 dimension invites a broader philosophical and practical reconsideration of information's role in management science. Future research and practice should explore how informational fields influence organisational dynamics, strategy formulation, and decision-making processes. Engaging with these concepts could unveil new pathways for leveraging information in ways that are currently unimagined, fostering innovation and adaptability in an increasingly complex and information-driven world.

Integrating Burkhard Heim's Unified Field Theory into management science illuminates the complexities of organisational dynamics through the lens of the mind-body-spirit triad, offering a multifaceted perspective that melds consciousness with the physical realities of organisational environments. Hoffman (2014) re-interpreted reality by proposing that physical reality is a construct derived from consciousness rather than an objective substrate independent of perception. Central to Hoffman's (2014) theory is the concept of conscious agents, entities capable of experiencing, making decisions, and interacting with others. This paper therefore argued that these conscious agents operate within a multidimensional space modelled effectively using Heim's 12-dimensional framework, which transcends the limitations of our conventional four-dimensional understanding of time.

Heim's 12-dimensional space offers a comprehensive structure where each dimension contributes to the complex interplay between various levels of consciousness and reality. The lower four dimensions align with our physical understanding of space and time, while the higher dimensions encompass additional degrees of freedom that facilitate interactions on a more abstract, non-physical plane. Within this multidimensional construct, time assumes a unique role and operates only in the lower dimensions from X1 to X6. This paper further argues that time is an intrinsic aspect of the physical universe and a construct emerging from the interactions of conscious agents. Beyond X6, timelessness prevails.

Hoffman (2014) suggested that the perception of time arises from the decision-making processes of conscious agents, involving sequences of experiences and choices interpreted as the flow of time. Thus, the linear progression of time we experience is a manifestation of the underlying dynamics of conscious agents interacting only within Heim's X_1 to X_6. Thus, the construction of physical reality is a byproduct of these interactions within the four dimensions including X_5 and X_6 shaping the agent's experiences and interactions, constructing the physical reality we observe. In this model, physical objects and phenomena do not exist independently of perception but are products of the perceptual processes of conscious agents. This ontological stance aligns with a broader trend in cognitive science and philosophy that challenges the primacy of the physical world, suggesting that our experiences and perceptions are central to the constitution of reality. This paper's approach underscores the significance of consciousness in shaping our understanding of the

universe, proposing that the physical world is ultimately a construct of our collective consciousness at the X_9 to X_{12} dimensions, filtered through the multidimensional interactions of complex conscious agents.

This approach encourages a deeper examination of how unseen, intangible forces—akin to the hidden dimensions in quantum physics—influence organizational behaviours and decision-making.

Theoretical Insights: Theoretically, the application of Heim's theory posits that the 'body' refers to all material manifestations, including an organisation—the physical structures, processes, and observable behaviours interact dynamically with the 'mind' or the collective consciousness of the organisation. This interaction reflects the tangible actions and motivations, intentions, and energies that drive these actions. The 'spirit' component, associated with the G4 dimension, permeates all organisational interactions. This pervasive influence is integral in shaping the emergence and dissolution of physical manifestations within the organisational structure, identified in the X_5 dimension as arising from inherent potentials. Furthermore, the spirit component underpins the X_6 dimension, which drives the organisation towards survival, sustainability, and cultivating a distinct identity. These processes are influenced by non-material dimensions that dictate behaviours. This spiritual dimension, though intangible, plays a crucial role in the organisational life, subtly guiding its trajectory, thus suggesting a profound link between unseen forces and tangible organisational outcomes.

In exploring how spiritual energy, conceptualized as a subtle form of information, influences individuals' mental and physical aspects, a multidimensional approach is essential. This perspective posits that spiritual energy operates as an integral component of the broader informational matrix that impacts human cognition and physiology.

From a theoretical standpoint, spiritual energy can be considered a non-material influence that permeates individuals' mental and physical realms. This form of energy, often associated with consciousness and intentionality, is hypothesized to interact with the body's bioenergetic fields, potentially influencing psychological states and physiological processes. Such interactions are thought to manifest in various forms, including enhanced mental clarity, emotional stability, and even physical health improvements.

Academically, the notion of spiritual energy aligns with the 'information field' concept described in quantum mechanics and consciousness studies. This field $I^{2,}$ encompassing dimensions X_7 and $X_{8,}$ is believed to transcend traditional physical interactions, suggesting a form of non-local communication between individuals' consciousness and their biological systems. The hypothesis is that spiritual energy interacts with the informational field and facilitates intra- and inter-personal communication not bound by conventional physical laws.

Psychologically, the impact of spiritual energy on the mind could be observed through changes in perception, mood, and cognitive functions. Research in psycho-neuroimmunology has provided insights into how mental states can influence physiological processes and vice versa. Spiritual practices such as meditation, prayer, and mindfulness, aimed at harnessing this subtle energy, have been shown to reduce stress, alleviate anxiety, and promote well-being.

Physiologically, the interaction between spiritual energy and the body may be mediated through the body's energy systems, such as the chakras or meridians, which are traditional concepts in Eastern medical and spiritual practices.

These systems are thought to channel spiritual energy through the body, influencing organ function, immune response, and energy levels. Modern scientific investigations into these areas often focus on measurable outcomes such as changes in heart rate variability, cortisol levels, and brain wave patterns, attempting to bridge the gap between metaphysical concepts and empirical science.

In conclusion, this interdisciplinary inquiry blends elements of psychology, physiology, and spirituality to forge a more holistic understanding of organisational behaviour from the mind-body-spirit perspective. Further research, with advanced measurement techniques and rigorous experimental designs, is necessary to substantiate the role of spiritual energy within the scientific paradigm.

Practical Implications: Heim's theory impels organisational leaders to consider dimensions when formulating decisions and crafting organizational strategies. The mind-body-spirit triad underlines that effective leadership and governance transcend mere manipulation of tangible resources and the observable decision-making processes within the material realm (R^3 and T). Instead, leadership necessitates a deep connection with the organisation's spirit or energetic composition, ensuring it resonates with the organisation's intentions and strategic goals as well as the well-being of its workforce. Adopting this triadic framework offers a richer perspective, enabling a more holistic comprehension of organisational evolution, adaptability, and the integration of its core spirit over time. The conceptual framework posits that organizations, like living organisms, transcend physical structures to embody complex conscious agents shaped by a confluence of energy, information, and consciousness. This perspective is derived from the collective input of complex conscious agents' minds, bodies, and spirits within the organization. Each agent contributes a distinct energy, which, when harmoniously integrated, forms the cohesive fabric of the organizational structure. This integrative process is critical, as energies not synergistically aligned can create discord within the organization, much like uncoordinated electromagnetic forces that can tear a physical structure. Hence, successfully managing these energies is crucial to maintaining organizational integrity and effectiveness. Recognising organisations as amalgamations of diverse yet interconnected energies emphasises the importance of a holistic approach to management that fosters alignment and synergy among the varied elements contributing to the organisation's overall dynamism. This expanded view encourages leaders to cultivate an environment where individuals' diverse contributions are recognised and effectively integrated, thereby enhancing the organisation's capacity to achieve its objectives while maintaining structural and functional cohesion. This view aligns with emerging trends in organisational theory that emphasise the importance of psychological and socio-cultural factors in organizational success.

In conclusion, applying Heim's Unified Field Theory through the mind-body-spirit triad offers a novel and enriching perspective on management science. It challenges traditional views and practices by advocating for a more integrated approach to understanding and managing organisations. This approach recognises the complex interplay between the visible and invisible forces that shape organisational realities. This paradigm shift enriches theoretical discourse and enhances practical management strategies, potentially leading to more holistic, adaptive, and conscious organisational practices.

Conclusion

By redefining spirituality as a combination of energy and information, the paper deepens the theoretical understanding of spirituality's impact on human behaviour and organisational processes. It examines how spiritual energy interacts with individuals' mental and physical aspects through Heim's 12-dimensional framework, offering novel insights into its influence on organisational culture, leadership, and teamwork. The research proposes a quantum-informed management model, emphasising the nonlinear and interconnected facets of organisational practices and human relations and integrating spiritual well-being into organisational effectiveness and culture.

This study expands the theoretical horizons of management science and provides practical implications for fostering holistic well-being and performance in organisational settings. Adopting a cross-disciplinary methodology bridges gaps between physics, psychology, and management, advocating for a comprehensive and integrative approach to understanding and managing modern organisations.

About the Authors

First and corresponding author

Dr David Leong, PhD
University of Canberra
Email: david.leong@canberra.edu.au

David Leong, Ph.D., is an entrepreneurship theorist with more than two and a half decades of experience as an entrepreneur. He started his entrepreneurial ventures early, soon after graduating from the National University of Singapore in 1994 with a Bachelor of Business Administration degree. He has two PhDs – one from Charisma University and the other from the University of Canberra. He has founded at least fifteen ventures spanning corporate finance, business and marketing consultancy, technology solutions, asset management to human resources (HR). He is widely regarded as an expert resource and a leader in the business field. In addition, local media, such as The Straits Times, Business Times, Lianhe Zaobao, and Channel News Asia, often seek his views on economics, politics and HR issues. His research is in entrepreneurship. His other research interest is the Chinese Yijing (Book of Changes). He draws the relatedness of Yijing with modern science, particularly quantum physics. He is the author of several scientific and professional articles, as well as chapters in books. He also published a book "Uncertainty, Timing and Luck on Quantum Terms in Entrepreneurship". ORCID: 0000-0002-9440-3606.

- https://orcid.org/0000-0002-9440-3606
- https://canberra.academia.edu/DavidLeong
- https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4694278
- http://straitstrades.com/david/

Second Author

Lau Yin Cheng

National University of Singapore

Email: yincheng.lau@gmail.com

Lau Yin Cheng is a Strategic Advisor to C-level Executives, Start-up Founders, and Boards in harmonizing complex business & people challenges, connects them with relevant partners including investors, and works alongside them to realize their full potential. YC has more than 20 years of experience in MNCs, Start-ups, & Government HR & OD leadership experience in Hi-Tech, Telecommunications, Hospitality, Transportation, and Supply Chain Management sectors across Asia Pacific, Europe & North America.

He is an electrical engineer by training and obtained a Master's degree via research from the National University of Singapore. He has a Graduate Diploma in Organisation Development from NTL Institute in the US and Singapore Civil Service College. He started his career in the Ministry of Manpower with stints in Labour Relations and Employment Pass where he worked closely with various economic agencies to attract and bring in foreign talent to drive Singapore's economic growth.

Third Author

Arthur Chen

National Chung Kung University

Email: art.chen.sg@gmail.com

Arthur holds a Bachelor's degree in Electrical Engineering from National Chung Kung University and a Master's degree in Solid State Science from National Chao Tung University. He brings over 30 years of professional experience from his work with General Instruments and Motorola, where he specialized in sales and marketing operations within the semiconductor products and telecommunication market segments. Additionally, Arthur has dedicated 23 years to working with Small and Medium-sized Enterprises (SMEs) and is the founder of U-SUN Healthcare.

Beyond his extensive professional background, Arthur has a profound commitment to personal and holistic development. He has practiced Qi Kung for over 35 years and is well-versed in Tai Chi, Meditation, Pranic Healing, and Ahartic Yoga. In recent years, Arthur has expanded his studies to encompass Philosophy, Religion, Art, Energy Healing, Information, and Consciousness Healing. His interdisciplinary approach has led him to explore and develop methods for identifying the root causes of chronic diseases and creating solutions through holistic healing practices.

Arthur's unique blend of technical expertise, business acumen, and deep understanding of holistic practices positions him as a thought leader in the integration of technology and holistic health. His work continues to contribute significantly to the fields of energy healing and consciousness studies.

Statements and Declarations

Conflict of Interest Statement

The author declares that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Footnotes

[1] Zurek (2009) posited that the environment acts as a repository for multiple redundant records of the states of a quantum system. These records are the result of continuous interactions between the quantum system and its environment. The environment, through processes akin to natural selection, preferentially proliferates information about certain states that are fragile and subject to collapse on observation. Zurek (2009) described how the quantum fragility of a single quantum state through an observer—typically characterised by superpositions and entanglement—gives way to the classical robustness of states as the observer interacts with the environment. This certain state becomes the prevailing reality imprinted on the environment, therefore known to the observer. These states effectively 'survive' the decoherence process, much like the fittest species survive in Darwinian natural selection.

[2] The Galilean observer is a cornerstone concept in classical mechanics, embodying the principles of inertia, relative motion, and the invariance of physical laws across inertial frames (Ramadas et al., 1996). In classical mechanics, a Galilean observer is one who perceives the laws of physics, particularly the laws of motion, in a uniform and consistent manner, regardless of their constant velocity relative to other observers. This notion is fundamental to Galilean relativity, which asserts that the basic laws of physics are the same in all inertial frames of reference. While it provides a robust framework for understanding classical phenomena, its limitations in the realms of relativity and quantum mechanics underscore the evolution of the observer concept in modern physics. The transition from the Galilean framework to more advanced theories exemplifies the dynamic nature of scientific inquiry and the continuous quest for a deeper understanding of the universe.

[3] In Heim's theoretical context, the entelechial dimension pertains to the intrinsic potentialities that drive the evolution and development of entities within the universe. This dimension is not confined to physical properties but encompasses the

latent capabilities and ultimate purposes embedded within the fabric of existence. In Heim's multidimensional model, the entelechial dimension serves as a crucial aspect of the higher-dimensional structure, influencing the manifestation of physical and non-physical phenomena. It represents a realm where the latent potential of entities is actualized, guided by a deeper, inherent purpose that transcends mere physical interactions. This interpretation aligns with Heim's broader goal of unifying the fundamental forces of nature and providing a holistic understanding of reality that includes both material and immaterial aspects.

[4] Aeonic dimension represents the aspect of reality that deals with the timeless and enduring qualities of the cosmos. It is a dimension where time is not experienced as a linear flow but rather as an eternal presence, influencing the continuity and stability of the universe. This dimension helps to account for phenomena that appear to transcend the conventional constraints of time, providing a more comprehensive understanding of the temporal dynamics at play in the universe.

References

- Azarian, B. (2022). *The romance of reality: How the universe organizes itself to create life, consciousness, and cosmic complexity*. BenBella Books.
- Baek, J. (2023). Exploring mass–energy equivalence with consideration of quantum nature. *European Journal of Physics*, *44*(6), 063001. https://doi.org/10.1088/1361-6404/acf746
- Battiston, F., Amico, E., Barrat, A., Bianconi, G., Ferraz de Arruda, G., Franceschiello, B., Iacopini, I., Kéfi, S., Latora, V., Moreno, Y., Murray, M. M., Peixoto, T. P., Vaccarino, F., & Petri, G. (2021). The physics of higher-order interactions in complex systems. *Nature Physics*, *17*(10), 1093–1098. https://doi.org/10.1038/s41567-021-01371-4
- Bergonzi, M., & Luisi, P. L. (2017). *The Consciousness of Space, the Space of Consciousness*(pp. 359–369). https://doi.org/10.1007/978-3-319-44418-5_29
- Bernal-Casas, D., & Oller, J. M. (2023). Information-Theoretic Models for Physical Observables. *Entropy*, *25*(10), 1448. https://doi.org/10.3390/e25101448
- Bohm, D. (2002). Wholeness and the implicate order. In *Psychology Press.* (Vol. 31, Issue 10). Psychology Press. https://doi.org/10.1088/0031-9112/31/10/042
- Bohm, David, & Stapp, H. P. (1994). The Undivided Universe: An Ontological Interpretation of Quantum Theory. *American Journal of Physics*, *62*(10), 958–960. https://doi.org/10.1119/1.17695
- Carbon, C.-C. (2014). Understanding human perception by human-made illusions. *Frontiers in Human Neuroscience*, *8*. https://doi.org/10.3389/fnhum.2014.00566
- Chalmers, D. J. (1997). *The conscious mind: In search of a fundamental theory*. Oxford Paperbacks.
- Christensen, F. (1981). Special relativity and space-like time. *The British Journal for the Philosophy of Science*, *32*(1), 37–53.
- Clayton, P. (2004). *Mind and emergence: From quantum to consciousness*. OUP Oxford.
- Collins, A. (1984). Action, Causality, and Teleological Explanation. *Midwest Studies in Philosophy*, *9*(1), 345–369. https://doi.org/10.1111/j.1475-4975.1984.tb00067.x

- Corris, A. (2022). An enactive-developmental systems framing of cognizing systems. *Biology & Philosophy*, *37*(4), 32. https://doi.org/10.1007/s10539-022-09865-y
- Daft, R. L., & Lengel, R. H. (1986). Organizational Information Requirements, Media Richness and Structural Design. *Management Science*, *32*(5), 554–571. https://doi.org/10.1287/mnsc.32.5.554
- Davis, J. (2013). *Alternate realities: how science shapes our vision of the world* Springer.
- Einstein, A. (1916). The foundation of the general theory of relativity.*Annalen Phys*, *49*(7), 769–822.
- Einstein, A. (1935). Elementary derivation of the equivalence of mass and energy.*Bulletin of the American Mathematical Society*, *41*(4), 223–230.
- Fields, C. (2012). If Physics Is an Information Science, What Is an Observer?*Information*, *3*(1), 92–123. https://doi.org/10.3390/info3010092
- Fradkin, D. (2024). Breaking through the doors of perception, consciousness, and existence: to what extent does psychedelic phenomenology ontologically depend on external factors? *Journal of Psychedelic Studies*, *8*(1), 122–141. https://doi.org/10.1556/2054.2022.00168
- Freud, S. (1900). *The Interpretation of Dreams*. Leipzig & Vienna: Franz Deuticke.
- Gardenfors, P. (2004). *Conceptual spaces: The geometry of thought* MIT Press.
- Glattfelder, J. B. (2019a). *A Universe Built of Information*. 473–514. https://doi.org/10.1007/978-3-030-03633-1_13
- Glattfelder, J. B. (2019b). *The Consciousness of Reality* (pp. 515–595). https://doi.org/10.1007/978-3-030-03633-1_14
- Goff, P. (2017). *Consciousness and fundamental reality*. Oxford University Press.
- Gomez, P.-Y., & Jones, B. C. (2000). Crossroads—Conventions: An Interpretation of Deep Structure in Organizations. *Organization Science*, *11*(6), 696–708. https://doi.org/10.1287/orsc.11.6.696.12530
- Greene, B. (2000). *The elegant universe: Superstrings, hidden dimensions, and the quest for the ultimate theory.* Vintage.
- Harman, P. M. (1982). *Energy, force and matter: the conceptual development of nineteenth-century physics* Cambridge University Press.
- Harrison, M., & Shirom, A. (1998). *Organizational diagnosis and assessment: Bridging theory and practice*. Sage Publications.
- Heim, B. (1999). Elementary Structures of Matter. *Unified Structural Quantum Field Theory of Matter and Gravitation*
- Heisenberg, W. (1949). The physical principles of the quantum theory. *Courier Corporation.*
- Heydenreich, A. (2021). Epistemic Narrativity in Albert Einstein's Treatise on Special Relativity.*Literatur-Und Naturwissenschaften*, 49.
- Hoffman, D. (2008). Conscious realism and the mind-body problem. *Mind and Matter*, *6*(1), 87–121.
- Hoffman, D. D. (2014). The Origin of Time In Conscious Agents. *Cosmology*, *18*, 494–520.
- Jung, C. G. (1936). The concept of the collective unconscious.*Collected Works*, *9*(1), 42.
- Kafatos, M., & Nadeau, R. (2012). *The conscious universe: part and whole in modern physical theory*. Springer Science & Business Media.
- Karakostas, V. (2012). Realism and Objectivism in Quantum Mechanics. *Journal for General Philosophy of Science*, *43*(1), 45–65. https://doi.org/10.1007/s10838-012-9173-5

- Koch, C., Massimini, M., Boly, M., & Tononi, G. (2016). Neural correlates of consciousness: progress and problems. *Nature Reviews Neuroscience*, *17*(5), 307–321. https://doi.org/10.1038/nrn.2016.22
- Laszlo, E. (1995). *The interconnected universe: Conceptual foundations of transdisciplinary unified theory*. World Scientific.
- Laughlin, C. D. (2023). Consciousness as an intelligent complex adaptive system: A neuroanthropological perspective. *Anthropology of Consciousness*. https://doi.org/10.1111/anoc.12213
- Leong, D. (2023). Opportunity-as-hologram, real or artificial in entrepreneurship. *Asian Academy of Management Journal*. https://ejournal.usm.my/aamj/article/view/3190/early-view
- LEONG, D. (2021). RE-CONTEXTUALIZING OPPORTUNITY AS ARTIFACT SIGNALLING FOR ENTREPRENEURIAL ACTION. *Journal of Developmental Entrepreneurship*, 2150021. https://doi.org/10.1142/S1084946721500217
- Leong, David. (2023). Action in Complexity: Entanglement and Emergent Order in Entrepreneurship. *The Journal of Entrepreneurship*, 097135572311595. https://doi.org/10.1177/09713557231159516
- Leong, David. (2024a). Uncertainty and information causality in opportunity-as-artefact driving entrepreneurial actions. *Revista de Gestão*, *31*(1), 50–64. https://doi.org/10.1108/REGE-09-2021-0168
- Leong, David. (2024b). Re-contextualizing Heim's 12 Dimensions: A Comparative Analysis with Contemporary Theories of Energy, Reality, and Consciousness. *Qeios*. https://doi.org/10.32388/INE7XM
- Leong, S. K. (2023). Organizational Homeostasis: A Quantum Theoretical Exploration With Bohmian And Prigoginian Systemic Insights. *Qeios*. https://doi.org/10.32388/4R1VW5
- LePoire, D. J. (2020). *Exploring the Singularity Concept Within Big History* (pp. 77–97). https://doi.org/10.1007/978-3-030-33730-8_3
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, *14*(S2), 95–112. https://doi.org/10.1002/smj.4250141009
- Liboff, A. R. (2017). The electromagnetic basis of social interactions. *Electromagnetic Biology and Medicine*, *36*(2), 177–181. https://doi.org/10.1080/15368378.2016.1241180
- Logan, J. D. (1897). The Aristotelian Teleology. *The Philosophical Review*, *6*(4), 386. https://doi.org/10.2307/2176001
- Lyon, P. (2004). Autopoiesis and knowing: reflections on Maturana's biogenic explanation of cognition. *Cybernetics & Human Knowing*, *11*(4), 21–46.
- Malabou, C. (2016). *Before tomorrow: Epigenesis and rationality*. John Wiley & Sons.
- Marshak, R. J. (2006). *Covert processes at work: Managing the five hidden dimensions of organizational change*. Berrett-Koehler Publishers.
- Maturana, H. R., & Varela, F. J. (1991). *Autopoiesis and cognition: The realization of the living* (Vol. 42). Springer Science & Business Media.
- Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. *Information & Management*, *58*(3), 103434. https://doi.org/10.1016/j.im.2021.103434
- Monroe, C., Meekhof, D. M., King, B. E., & Wineland, D. J. (1996). A "Schrödinger Cat" Superposition State of an

Atom. *Science*, *272*(5265), 1131–1136. https://doi.org/10.1126/science.272.5265.1131

- Navon, D. (1991). The function of consciousness or of information? *Behavioral and Brain Sciences*, *14*(4), 690–691. https://doi.org/10.1017/S0140525X00072022
- Nonaka, I., & Takeuchi, H. (2009). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- O'Reilly, C. A., & Tushman, M. L. (2013). Organizational Ambidexterity: Past, Present, and Future. *Academy of Management Perspectives*, *27*(4), 324–338. https://doi.org/10.5465/amp.2013.0025
- Pearson, K. A. (2002). On machines, technics and evolution. In *Deleuze and Philosophy: the difference engineer* (p. 180).
- Pina e Cunha, M., & Vieira da Cunha, J. (2006). Towards a complexity theory of strategy. *Management Decision*, *44*(7), 839–850. https://doi.org/10.1108/00251740610680550
- Prigogine, L., & Stengers, I. (1984). *ORDER OUT OF CHAOS: MAN'S NEW DIALOGUE WITH NATURE* Bantam Books, Inc.
- Pulvermüller, F., Tomasello, R., Henningsen-Schomers, M. R., & Wennekers, T. (2021). Biological constraints on neural network models of cognitive function. *Nature Reviews Neuroscience*, *22*(8), 488–502. https://doi.org/10.1038/s41583-021-00473-5
- Ramadas, J., Barve, S., & Kumar, A. (1996). Alternative conceptions in Galilean relativity: inertial and non-inertial observers. *International Journal of Science Education*, *18*(5), 615–629. https://doi.org/10.1080/0950069960180509
- Rammel, C., Stagl, S., & Wilfing, H. (2007). Managing complex adaptive systems — A co-evolutionary perspective on natural resource management. *Ecological Economics*, *63*(1), 9–21. https://doi.org/10.1016/j.ecolecon.2006.12.014
- Roederer, J. (2003). On the Concept of Information and Its Role in Nature. *Entropy*, *5*(1), 3–33. https://doi.org/10.3390/e5010003
- Sassoli de Bianchi, M. (2013). The Observer Effect. *Foundations of Science*, *18*(2), 213–243. https://doi.org/10.1007/s10699-012-9298-3
- Schrödinger, E. (1935). The present status of quantum mechanics. *Die Naturwissenschaften*, *23*(48), 1–26.
- Senge, P. M. (1990). *The art and practice of the learning organization*. New York: Doubleday.
- Skinner, B. F. (1984). Selection by consequences. *Behavioral and Brain Sciences*, *7*(4), 477–481. https://doi.org/10.1017/S0140525X0002673X
- Sokolovski, D. (2020). Quantum Measurements with, and Yet without an Observer. *Entropy*, *22*(10), 1185. https://doi.org/10.3390/e22101185
- Stacey, R. D. (1995). The science of complexity: An alternative perspective for strategic change processes. *Strategic Management Journal*, *16*(6), 477–495. https://doi.org/10.1002/smj.4250160606
- Stonier, T. (2012). *Information and the internal structure of the universe: An exploration into information physics.* pringer Science & Business Media.
- Stonier, Tom. (1996). Information as a basic property of the universe. *Biosystems*, *38*(2–3), 135–140. https://doi.org/10.1016/0303-2647(96)88368-7
- Travis, F. (2020). On the Neurobiology of Meditation: Comparison of Three Organizing Strategies to Investigate Brain

Patterns during Meditation Practice. *Medicina*, *56*(12), 712. https://doi.org/10.3390/medicina56120712

- Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review*, *38*(4), 8–29. https://doi.org/10.2307/41165852
- Vopson, M. M. (2019). The mass-energy-information equivalence principle. *AIP Advances*, *9*(9).
- Wachbroit, R. (1994). Normality as a Biological Concept.*Philosophy of Science*, *61*(4), 579–591. https://doi.org/10.1086/289823
- Wallace, B. (1996). *Choosing Reality: a Buddhist View of Physics and the Mind* Snow Lion Publications.
- Wallace, B. A. (2010). *Hidden dimensions: The unification of physics and consciousness.*Columbia University Press.
- Wheatley, M. (2011). *Leadership and the new science: Discovering order in a chaotic world.*ReadHowYouWant. com.
- Wheeler, J. A. (2018). Information, physics, quantum: The search for links. In*Feynman and computation* (pp. 309–336).
- Zeilinger, A. (2010). *Dance of the Photons: From Einstein to Quantum Teleportation* Farrar, Straus and Giroux, New York.
- Zohar, D. (1997). *Rewiring the corporate brain: Using the new science to rethink how we structure and lead organizations*. Berrett-Koehler Publishers.
- Zurek, W. H. (2009). Quantum Darwinism. *Nature Physics*, *5*(3), 181–188. https://doi.org/10.1038/nphys1202