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Ancient Philosophy, Quantum Reality and Management

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Abstract

The romanticism of management for numbers, metrics and deterministic models driven by mathematics, is not new. It still exists. This is exactly the problem which classical physicists had in the late 19th century until Werner Heisenberg brought the uncertainty principle and opened the doors of quantum physics that challenged the deterministic view of the physical world mostly driven by the Newtonian view. In this paper, we propose an uncertainty principle of management and then list a set of factors which capture this uncertainty quite well and arrive at a new view of scientific management thought. The new view which we call as the Quantum view of Management (QVM) will be based on the major tenets from the ancient philosophical traditions viz., Jainism, Taoism, Advaita Vedanta, Buddhism, Greek philosophers (like Hereclitus) etc.

Keywords*: Ancient Philosophy, Quantum Reality, Management, QVM*

Introduction

We have never felt so much "interconnectivity" as we feel today in this era of digital revolutions. The analytics that we use in real time data is literally driving the world view. Even a small tweet can lead to whole series of discussions and arguments converting a matter which caught no attention to an issue of national and international debate. The observer affects the measurement of an event too and so the result or outcome measured changes during the very act of observation applying our perceptual and intellectual constructs. The idea of complexity and nonlinearity is not just restricted to fields of natural sciences. They are much observable phenomena even in studies of the society and behaviour of organizations and institutions. The scientific view of management is still very much alive.

However there have been many criticisms of this scientific view in the last decade and most prominently in the post-2008 era. Many of the empirical views and measurements that lead to the so called "scientific" assumptions influencing business decisions were severely questioned and criticised for their dehumanising approach. One of the leading proponents of this thought was Sumantra Ghoshal who said that-

"Rejecting what we saw as the "romanticism" of analysing corporate behaviours in terms of the choices, actions, and achievements of individuals (e.g., Andrews, 1980), we have adopted the "scientific" approach of trying to discover patterns and laws, and have replaced all notions of human intentionality with a firm belief in causal determinism for explaining all aspects of corporate performance. In effect, we have professed that business is reducible to a kind of physics in which even if individual managers do play a role, it can safely be taken as determined by the economic, social, and psychological laws that inevitably shape peoples' actions." (Ghoshal, 2005).

However, to say that natural sciences should never be applied in the fields of social sciences including management and that they dehumanise the whole concept of management, can also be argued. One of the important contributions that had a significant

influence on the way social sciences is approached, came from Thomas Kuhn. And I want to put forward the following arguments:

1. Management as a theory evolved and emerged through endeavours of many economists and social scientists who used their scientific methods for coming down to a logical framework of human behaviour. It all started with the Scientific theory of Management which was at the heart of wealth creation through productive enterprises.

2. The laws of natural sciences viz., physics, chemistry, biology, mathematics form the core of explanations of the way the human brain functions and the chemistry of emotions that influence the rationality of the decisions made by the economic agents i.e., the individuals and the organizations.

3. The way science should be applied to management however needs to change because of the existence of randomness due to quantum behaviour. Quantum physics shapes the way the consciousness of individuals evolves and so this narrative should be included in the overall understanding of management as a theory and in practice.

Most of modern management as we see it today still retains most part of this classical theories especially the scientific theory of management and extends it to the use of statistical and quantitative techniques towards the understanding of behaviour at an organizational, societal and individual level. But most of the theory and concepts aim at a "control approach" or rather a fully deterministic approach. The romanticism of management for numbers, metrics and deterministic models driven by mathematics, still exists. This is exactly the problem which classical physicists had in the late 19th century until Werner Heisenberg brought the uncertainty principle and opened the doors of quantum physics which assumes the wave-particle duality of matter. Erwin Schrödinger proposed a wave function to denote the evolution of the "quantum" particle that is more probabilistic rather than deterministic as proposed by Newtonian view earlier.

A very similar duality also exists in the world of management that we observe. Management principles and theories increasingly try to provide deterministic models for decision making and heuristics but individuals who become managers, the subject of management i.e. the organizations and individuals all behave "randomly". The economic non-human factors can be deterministic but the human actors or participants are more probabilistic or random.

In this paper we propose a begin with a discussion of this dichotomy or duality, propose the uncertainty principle of management and then list a set of factors which capture this uncertainty quite well and arrive at a new view of scientific management thought. The new view which we call as the Quantum view of Management (QVM) will be based on the major tenets from ancient philosophical traditions viz., Jainism, Taoism, Advaita Vedanta, Buddhism, Greek philosophers (like Hereclitus) etc.

Revisiting "Uncertainty principle" for a quantum view of reality

Most of the scientific conceptions divide the object from the subject, the actor from the action, the mind from the matter, the organization or business from the constituent i.e., the stakeholders. The existence of this dichotomy is an act of convenience for measurement because then researchers can focus more on the deterministic aspects of reality (like the economic factors in business) and plainly overlook the fuzzy and subjective aspects of reality (like consciousness). If we trace the entire historical evolution of modern management, we would see that management researchers have consistently tried to arrive at a deterministic notion for the ever evolving and dynamic reality and every

theory has been more or less contextual with limited applicability. The more we have tried to control, the more we have contributed to the uncertainty that surrounds the reality. This nearly replicates the notion of uncertainty principle that exists in quantum physics. Heisenberg who proposed the uncertainty principle in his famous paper in 1927 titled "Ueber den anschaulichen Inhalt der quantentheoretischen Kinematik and Mechanik" (in German) that was published in *Zeitschrift für Physik* said that:

"At the instant of time when the position is determined, that is, at the instant when the photon is scattered by the electron, the electron undergoes a discontinuous change in momentum. This change is the greater the smaller the wavelength of the light employed, i.e., the more exact the determination of the position. At the instant at which the position of the electron is known, its momentum therefore can be known only up to magnitudes which correspond to that discontinuous change; thus, the more precisely the position is determined, the less precisely the momentum is known, and conversely" (Heisenberg, 1927, p. 174-5).

This clearly sums up the inability of simultaneous measurement of position and time of a microscopic particle because if we exactly try to measure the position, the device of measurement affects the momentum of the particle (like electron) and so the accurate determination of one increases the uncertainty in determination of the other.

Uncertainty principle formed the basis of the new emergent view of explaining reality where the old Newtonian view of absolute space-times has to give way to a "relativity" view where space and time are not separate entities but constitute a unified evolving space-time continuum. As Capra states (1975): "Both space and time become merely elements of the language a particular observer uses for his description of the phenomena."

But there is greater claim that this uncertainty principle makes. That reality is affected by the observer of the reality and the device of measurement of reality. If an individual is witnessing the reality, the reality is not separate from the interpretation of the reality and the perceptual or psychological construct leading to that interpretation. Also, the evolution of the reality leads to experiences which again are affecting the perceptual construct of the same individual and so the interpretation of the same reality is again constantly changing. Indeterminism emerges as an unavoidable characteristic of any measurement of reality.

Quantum theory explains this reality in the form of a linear superposition of a series of quantum states in the form of "wave functions" which is a mathematical formulation of these states. Quantum theory claims that prior to measurement the wave function of a quantum system evolves into a linear superposition of different states, but that actual measurements always find the system in a definite state. Several attempts have been made to understand how this transition takes place (from many states to one definite state in the measurement). Research on consciousness has helped in explaining this process of these wave functions collapse to a single-state. (eg. Stapp, 1993, 1999; Goswami, 1995; Hameroff, 1994; Hameroff and Penrose, 1996)

This latest movement of quantum realism based on consciousness studies clearly leads to the following propositions that might constitute the formative elements for defining quantum reality:

Proposition 1a: *Interconnectedness is a natural property which ensures the inseparability of the reality from the witness of the reality.*

Proposition 1b: *Reality is flux.*

Both these propositions, as we would discuss subsequently, can be traced from ancient philosophical traditions like the *Vedanta* or the

philosophy of *Heraclitus*. Also, from the conception of *Anekantavada* in Jainism, reality is pluralistic.

The Copenhagen interpretation of uncertainty principle (by Bohr and Heisenberg) was criticised for its lack of objectivity. The most prominent criticism came from Karl Popper who said explained the reason for the schism as follows –

"Three fundamental issues have led to the schism: 1. Indeterminism versus Determinism. 2. Realism versus Instrumentalism. 3. Objectivism versus Subjectivism. The third issue arises, more especially, in connection with Heisenberg's indeterminacy relations and such questions as the reduction of wave packets; and more generally, with respect to the interpretation of probability.....My own view is that indeterminism is compatible with realism, and that the realization of this fact makes it possible to adopt a consistently objectivist epistemology, an objectivist interpretation of the whole of quantum theory, and an objectivist interpretation of probability." (Popper, 1982)

So, quantum view can't be rejected as completely subjective because as Popper says it leads to objectivist epistemology which is the basic intention of modern management theories too. It appears from Ghoshal's (2005) comments, which we saw earlier, that he misunderstood Popper's philosophy of science. Nonetheless, this misunderstanding serves as the catalyst for exploring Popper's notion that theory building is revolutionary and based on the replacement of existing theory resulting from empirical research (Shareef, 2007). We can propose hence that –

Proposition 2a – *Indeterminism is compatible with realism.*

Proposition 2b – *Reality can be expressed more objectively through considering the multi-world interpretation to the indeterminacy relations.*

In stark contrast, Everett addressed the measurement problem by merging the microscopic and macroscopic worlds. He made the observer an integral part of the system observed, introducing a universal wave function that links observers and objects as parts of a single quantum system. He described the macroscopic world quantum mechanically and thought of large objects as existing in quantum superposition as well. Breaking with Bohr and Heisenberg, he dispensed with the need for the discontinuity of a wave-function collapse. (Byrne, 2008)

According to Vaidman (2016), the multi-world interpretation (MWI) of Everett consists of two parts:

i. A mathematical theory which yields the time evolution of the quantum state of the (single) Universe.
ii. A prescription which sets up a correspondence between the quantum state of the Universe and our experiences.

This multi-world interpretation may act as the paradigm that bridges two seemingly distinct fields of study viz., management and physics and could possibly be a starting point towards defining objectively the reality in various management contexts assuming management systems to have a certain element of "indeterminacy" just like quantum systems. Managers constantly face a world with myriad of expectations, experiences, perspectives and interpretations and the whole process of sense-making in an uncertain world can be viewed with the lens of quantum physics through applying the Everett's multi-world interpretation of uncertainty.

In the present era of big data and increased analytic capabilities, businesses are able to develop many different views and perspectives of the same reality. There are so many analysis and results happening simultaneously by different individuals having their own unique perceptual constructs. But the process of sense-making in an overall

organizational level can be simulated with a quantum view of organization in which different information and interpretations represent a unique quantum state and the resultant view which leads to a decision can be seen as a superposition of these individual quantum states. The states can be considered to be "quantum" because humans are essentially "quantum" beings with a behaviour characterized by randomness and uncertainty.

Ancient philosophical reflections of the Multi-world view of reality

Most of the mystics of the ancient Vedic age have constantly spoken of the inner world and the outer world existing simultaneously for every individual. And the actions of the individual depend on the "world" they focus. Most of the deeper contemplative practices in ancient Indian and Vedic age focus on this inner world. This inner world has always been depicted as a very deep latent universe which presents itself as the ultimate spiritual end to pursued. The inner universe and the outer universe are one isolated by a body of senses which form the basis of our material existence.

In the Patanjali Yogic system which was proposed thousands of years ago by *Sage Patanjali* in his ancient treatise *Yoga Sutra,* he talks of the five afflictions of the human mind viz., *Avidya* (Ignorance), Ashmita (Ego), Raga (Attachment), Dvesha (Aversion), Avnivesh (Fear of Death). He proposed a set of stages (*Ashtanga Yoga*) that the mind needs to go through before it reaches the point where the mind is completely absorbed in the object of attention or meditation (*samadhi)*. In this state there is cessation of mental modifications and can be thought of as a mind with a time-independent stable quantum state with no evolution but which is in the Universal flow. The connection with the external world is nil and the mind is fully absorbed in the inner world. The *Ashtanga Yoga* can be considered to be the predominant *philosophy of mind* in those days and clearly demarcated *mind* (the consciousness part that acts like a wave function) from the matter (like the brain and body part). But both mind and body rejuvenation was the essence of a higher consciousness living with greater detachment from sensual and emotional aspects of life; which was fundamental for achieving a calm mind. The whole process started with gradually preparing the body for detachment from the external world.

The *Samkhya* philosophy in ancient India also talks of a multiple view of the same existence with a static *Purusha* which is the witness and the dynamic *Prakriti* which is constantly in flux. This is indeed the "reality in flux" which was advocated by *Hereclitus of Ephesus* and the *Purusha* aspect is consistent with *Parmenides'* notion of one reality that is eternal and unchangeable being. Both these aspects are simultaneously existing in a "being" as proposed by *Samkha* which constitute the inner stable reality and outer dynamic reality. And how our mind interprets and views these two world simultaneously can be understood with the notion of quantum superposition of these two world.

Managing can be seen as the act of making sense of a multi-perspective "many-worldly" reality where we create our own reality by being the witness to this dynamic, seemingly complex and ever changing reality with many dimensions of truth simultaneously existing and choosing a specific form or dimension of that reality among multiple perspectives co-exisiting. According to Chia (2005):

Managing is firstly and fundamentally the task of becoming aware, attending to, sorting out, and prioritizing an inherently messy, fluxing, chaotic world of competing demands that are placed on a manager's attention. It is creating order out of chaos. It is an art, not a science. Active perceptual organization and the astute allocation of attention is a central feature of the managerial task"

Without getting into the debate of managing as art or science, in this new quantum view of management we can say that it exhibits the character of both and the reality we create depends

on the "world" we allocate our attention to. And so, we again return to the problem of the "observer" and the "object of observation". According to the Greek sophist *Protagoras*:

"In perception there is motion from external object towards the sense organ. And yet again there is also a corresponding motion of the sense-organ towards the motion of the external object. Hence there is double motion, one from the external thing and another from the sense-organ of the percipient. But quite obviously perceiving is not the object perceived, and yet again perceiving is quite different from the perceiving subject. Thus perception is a product of both the object moving towards the subject, and the subject moving towards the object. This perception alone is knowledge." (Masih, 1947).

And so the famous saying of Protagoras *Homo Mensura,* i.e., Man is the measure of all things. What is true to me may not be true to someone else and so many truths co-exist or a truth can be both a truth and a lie simultaneously.

In *Jain* tradition this is called *Anekantvada* which is a doctrine of *manyness of reality* where "matter" (*pudgala)* and "spirit" (*jiva*) are regarded as separate and independent realities. The *Jainas* brilliantly captured the co-existence of the absolute and the relative in its doctrine of *Syatvada* which is sometimes also translated as a theory of *probability* or a theory of *relativity of knowledge.* Reality has infinite aspects and we can only know some at a given point of time. So our judgments are necessarily relative, conditional and limited. Everything exists from the point of view of its own substance, space, time and form and does not exist from the point of view of other's substance, space, time and form. The simultaneous existence and non-existence of a substance is possible because what seems to exist from one world may not exist as seen from another world. If we take it in the context of management, what exists in the view of one manager may not exist in the view of another manager and so we may apparently see the debate of both existence and non-existence or relevance and non-relevance of a certain phenomenon in a given context in a managerial discourse.

The problem of facing the challenge of uncertainty always existed and we see reflections of it in the ancient philosophies of both east and the west as we have seen above. But three things which clearly remain the same and can be possibly extended towards arriving a new view of management uncertainty are –

1. Many perspectives co-exist at the same time, even opposites
2. We can remain as a detached witness to the dynamic reality.
3. Reality can be seen as a superposition of realities that exist in multiple world views and the overall macroscopic view can be thought of as a superposition of these individual world views. We do see reflections of the many world interpretation and quantum uncertainty even in the various ancient philosophies.

The QVM Paradigm (Quantum view of Management)

Much of quantum physics remains intellectually inaccessible to practicing managers who look at any experiential reality more from the lens of philosophy and existing management paradigms and not from the way physicists view it. However, as we have seen, the current notions of reality are evolving, dynamic and multi-worlds coexisting which is a significant departure from the classical Newtonian view based on stable absolute space-times. Quantum view of reality is however having ancient philosophical origins. And much of ancient philosophy is more intellectually accessible to modern managers as they are shaping the way we approach the uncertain reality in modern management contexts. So, to connect the quantum aspects derived from physics to the field of management, we had to trace the multi-world view of quantum indeterminacy (in the previous

section) from the ancient philosophical traditions. This approach has two obvious advantages –

1. Reflections of quantum physics do exist in various ancient philosophical traditions as has been highlighted by many researchers in recent times (eg. Capra, 1975; Duquette, 2011)

2. It becomes more intellectually accessible to the practicing managers who may not have any prior background in physical sciences especially quantum physics.

We need a quantum view of management that simultaneously takes a rational deterministic logic and a relative view based on uncertainty and indeterminism to finally arrive at a decision.

The components of the proposed QVM paradigm that emerges from both quantum interpretation of uncertainty and the eternal principles of the ancient philosophies are as follows:

Interconnectedness

The notion of interconnectedness is the core of Indian mystical traditions where the Great Aranyaka Upanishad (*Brhad-āranyaka*) proclaims boldly "Aham Brahmasmi" or "I am the Universe". It states that –

"sa vā ayam ātmā sarvesām bhūtānām adhipatih; sarvesām bhūtānām rājā; tad yathā ratha-nābhau ca ratha-nemau cārāh sarve samarpitāh, evam evāsminn ātmani sarvāni bhūtāni sarve devāh sarve lokāh sarve prānāh sarva eta ātmanah samarpitāh"

- (Ch 5, Vth Brahmana, Shloka 15 , Brhad-āranyaka Upanishad)

which means that everything is controlled by the very presence of the Ātman (*individual self or consciousness*). As the spokes of a wheel are held together, just so in this self, all beings, all gods, all worlds, all breathing creatures, all these selves are held together. (Radhakrishnan, 1953). The Ātman here means the *individual self or consciousness that acts as the observer* and an integral part of the Universal consciousness or self called the Brahman.

Further it says that

"idam vai tan madhu dadhyann ātharvano 'śvibhyām uvāca, tad etad rsih paśyann avocat: puraś cakre dvipada, puraś cakre catuṣpadah. purah sa pakṣī bhūtvā purah puruṣa āviśat iti. sa vā ayam puruṣah sarvāsu pūrsu puriśayah, nainena kim ca nānāvrtam, nainena kim ca nāsamvrtam"

- (Ch 5, Vth Brahmana, Madhu-vidya Shloka 18 , Brhad-āranyaka Upanishad)

which means that - this Being which has become responsible for the interconnectedness of things is both living and non-living. The very Being became the vital consciousness of all physical bodies, and He is present in everybody. The Body that is Universal or Brahman and the body that is particularized or Ātman – there is nothing that it is not enveloping. (Radhakrishnan, 1953)

Something similar also resonates in the idea of Everett's interpretations when he tried to merge the macroscopic and microscopic reality to give a quantum interpretation to the states. In the words of Peter Byrne (2007):

"...Everett addressed the measurement problem by merging the microscopic and Macroscopic worlds. He made the observer an integral part of the system observed, introducing a "universal wave function" that links observers and objects as parts of a single quantum system. He described the Macroscopic world quantum-mechanically and thought of large objects as existing in quantum superposition as well. Breaking with Bohr and Heisenberg, he dispensed with the need for the discontinuity of a wave-function collapse."

Interconnectedness is a property that we are

experiencing in all aspects of the business and society. Information technology is rapidly breaking down all barriers of doing business and we are seeing so many new complicated transactions getting done just at the click of a button or through an app on your mobile device. Informational asymmetries are dissolving. People involved in transactions are more aware and informed. Today we are moving towards a revolution of connected devices in the digital space and it is significantly affecting the economic landscape. Also the connectivity of business and society has enhanced like never before. Even international and inter-continental mobility of people has significantly enhanced and we are noticing enhanced cultural and ethnical diversity at the workplace. But all of these are together creating a collective reality which looks the "same" but has many different aspects co-existing. The co-existence of stability and relativity, plurality and unity, is what we constantly witness in this grand interconnected world. As Emily Green, President & CEO of Yankee Group puts it:

"These developments, along with all of us, are just a few of the actors in a grand connectivity story playing out around the world. They are bringing us closer to a future of global connectivity, when all people, and all the things we care about, will be connected to each other on a vast digital network…..I have a much simpler way to talk about this world we're headed to: Anywhere….Not only will Anywhere be bigger than other technology transformations we've lived through before, it will also be faster." (quoted by Nagle, 2009)

We are constantly seeing management discourses highlighting aspects of collective interdependence and individual freedom of expression at the same time. If we observe any great leader, (s)he manifests the power to integrate diverse competencies, exhibited by diverse sets of people with different skills and capabilities, towards a common vision and purpose that is again manifestation of the aspirations of the leader and it all begins with the leader. And a leader is not a "leader" without followers. So, the two parts viz., the micro (leader) and the macro (stakeholders and collective set of people), are inseparable which again to me is the essence of interconnectedness that exists in management. The notion of *division of labour* in scientific theory needs to evolve into a notion of *interconnectedness* in this quantum view of management.

Consciousness or Mindfulness

The recent scientific researches done on consciousness (for eg. Hameroff, 1994; Hameroff & Penrose, 1996; Chalmers,1995) and on mindfulness (Davidson et al, 2003; Kabat-Zinn, 2003; Langer & Moldoveanu, 2000) brings on table some fascinating findings which reinforce not only the "quantum" nature of the brain but also how through contemplative practices of mindfulness meditation that focus non-judgmentally on the evolution of the reality "now", individuals are better able to handle stress by "rewiring" their thoughts. In the language of neuroscience, mindfulness based practices enhance neuroplasticity of the subjects and they exhibit heightened states of happiness and reduced levels of stress. Interestingly, this findings lead us to believe that –

1. Our consciousness of reality can change the way we perceive and respond to the reality.

2. Through heightened neuroplasticity an individual may have the capability to witness the same reality from multiple perspectives.

3. The essence of "living" in a dynamic reality is to focus on the non-judgmental evolution of "now" because it is in the now that both the macro and the micro dissolve into a stable mental state which leads to a stable world view.

In our discussions of uncertainty before, we have

seen how the observer and the observation are interconnected and one may affect the other. And so we argue for a "mindful" observer who will be a more stable witness for the complex ever-evolving reality. We can also redefine a mindful observer as one who has the capability to have multiple interpretations of the ever-evolving reality and through his / her non-judgmental awareness of the "now" is able to create a world-view that embraces the uncertainty being a stable detached witness to the dynamic reality ever in flux. It is all in the "managing" as it focuses on "now" instead of the "managers" who react first with a given perspective and try to control and justify the decision with the earlier perspective, but the reality has already changed. We need more conscious and mindful leaders who focus on "managing now" with a constant awareness of the "change" or flux moment-to-moment non-judgmentally.

Relativity

Even if the subject who witnesses the object may remain the same on a gross matter level, but his or her consciousness is ever evolving along with the Universal consciousness. The *Jainas* have always maintained the co-existence of stability and relativistic pluralism at the same time. *Relaitivity* is the natural consequence of the assumption that reality is in constant flux as *Hereclitus* claimed. Buddhistic treatise talks of *pratityasamutpada* or the theory of dependent origination which sometimes is equated with the theory of relativity. So the world view keeps changing and what is considered relevant and true today may be completely irrelevant and inconsistent in future. According to Sharma (1960), *pratityasamutpada* is "*…relativity and dependent causation as well as the Absolute, for it is the Absolute itself which appears mas relative and acts as the binding thread giving them unity and meaning. Pratityasamutpada tells us that in the empirical world dominated by the intellect everything is relative, conditional, dependent, subject to birth and death and therefore impermanent. ….*"

Going by this logic and also combining the quantum view, we can say that management theories and practices are relative and to propose any fixed paradigm that fits all contexts would be futile because management in practice is relative. And so if we need to include the notion of *relativity* both in theory development stage as well as while applying the theory in practice.

Conclusion

I would like to conclude this paper with a quote from Shuddhanandaa Brahmachari, the Founder of *Course in Mindfulness,* a program he runs at many universities and organizations around the globe. He says:

Consciousness is the light of the Soul. It is the essence of all that is. It is at this pre-space, the modern physics stumbles in awe to observe the quantum level of un-manifest and manifest in a continual dance of creation and destruction, nay continual dance of infinite forms and formlessness. The waves merging into the ocean and rising again only to merge with the ocean. From matter to energy and from energy to matter, an endless cycle beyond time and space! To say in simpler terms, Energy is the formless and matter is the form. Energy is the unmanifest and matter is the manifest. It is the Energy that gets reflected in the matter. One needs to realize that energy…the very core. (Brahmachari, 2012)

This brilliantly sums up the reason for conscious paradigm of the scientific management theories based on the quantum view.

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