

Quantum Physics, Chemistry, and Biology Reveal M&A Insights: Metaphor Analysis for People and Cultural Change Management

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Received: September 9, 2023

Revised: January 16, 2024

Accepted: January 26, 2024

Abstract

The purpose of this study is to provide new perspectives on organizational change management and development from the triangulation of scientific views, specifically on the phenomena of mergers and acquisitions (M&As). The deep relationship between subculture and corporate culture has been explored to support change management in the people dimension of an organization. Multidisciplinary methodology has been used in the research design with metaphor analysis and in-depth semi-structured interviews, and metaphor analysis has been applied to the literature review in order to compare three scientific views (physics, chemistry, and biology) for a deeper understanding of M&A phenomena. The data collection for the interviews was conducted with 21 employees who experienced M&A integration in a multinational company in electronics manufacturing in Thailand. The results from the metaphor analysis and the interviews indicate key findings regarding people-entropy management, employee development needs, and learning mechanisms for coping with M&As. This study reveals beneficial insights for business M&As by looking deeply into nature, leading to new perspectives for organizational change management.

Keywords: Mergers & acquisitions, Quantum, Corporate culture, Subculture, Organizational change management

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รับบทความ: 9 กันยายน 2566

แก้ไขบทความเสร็จ: 16 มกราคม 2567

ตอบรับบทความ: 26 มกราคม 2567

บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อให้มุมมองใหม่เกี่ยวกับการบริหารจัดการการเปลี่ยนแปลงในองค์การที่มีการควบรวมกิจการผ่านมุมมองทางวิทยาศาสตร์แบบสามเส้า (Triangulation) โดยทำการศึกษาความสัมพันธ์ระหว่างวัฒนธรรมย่อยและวัฒนธรรมหลักขององค์การ เพื่อเป็นข้อมูลที่เป็นประโยชน์ต่อการบริหารจัดการการเปลี่ยนแปลงในมิติด้านบุคลากรและวัฒนธรรมองค์การ ระเบียบวิธีวิจัยแบบสหวิทยาการถูกนำมาใช้ในการออกแบบการวิจัย โดยใช้การวิเคราะห์อุปมาอุปไมยและการสัมภาษณ์เชิงลึกถึงโครงสร้าง ซึ่งการวิเคราะห์อุปมาได้ถูกนำไปใช้กับการทบทวนวรรณกรรมเพื่อเปรียบเทียบมุมมองทางวิทยาศาสตร์จากสามสาขาวิชา ได้แก่ ฟิสิกส์ เคมี และชีววิทยา เพื่อให้ได้มาซึ่งความเข้าใจที่ลึกซึ้งยิ่งขึ้นในปรากฏการณ์ควบรวมกิจการ และได้ทำการเก็บข้อมูลสัมภาษณ์จากพนักงาน 21 คนที่มีประสบการณ์ตรงจากการควบรวมกิจการในบริษัทข้ามชาติ ในอุตสาหกรรมการผลิตอิเล็กทรอนิกส์ในประเทศไทย ผลลัพธ์จากการวิเคราะห์อุปมาอุปไมยและการสัมภาษณ์ชี้ให้เห็นถึงการค้นพบที่สำคัญเกี่ยวกับการบริหารจัดการสภาวะอารมณ์ภายในจิตใจของบุคคล ความต้องการการพัฒนาของพนักงาน และกลไกการเรียนรู้เพื่อรับมือกับสถานการณ์ควบรวมกิจการที่เกิดขึ้น การวิจัยนี้เผยให้เห็นข้อมูลเชิงลึกที่เป็นประโยชน์สำหรับการควบรวมกิจการผ่านการมองอย่างลึกซึ้งในธรรมชาติ ซึ่งนำไปสู่มุมมองใหม่สำหรับการบริหารการเปลี่ยนแปลงขององค์การ

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Introduction

Using insights from triangulated sources of knowledge (Moon, 2019) from physics, chemistry, and biology, aligned with metaphor analysis for understanding phenomena (Stanley et al., 2021), the authors investigated the multiple paradigms of quantum perspective, chemical reaction, and biological adaptation to the environment for deeply understanding the phenomena of mergers and acquisitions (M&As).

Figure 1 Mergers and Acquisitions as a Cooking Metaphor



M&As as a cooking metaphor (Figure 1) may deliver either a masterpiece menu or a catastrophic fire in an organization. It depends how the psychological and physical environments are handled (Phaopat & Pruetipibultham, 2018). As a sumptuous dish, M&As can be served as a strategic business tool for management to enable faster organizational growth and cross-border expansion in countries and industries worldwide (Deloitte, 2023b). Since the COVID-19 pandemic began, however, several companies have paused their M&A plans and executions because of global inflation, rising interest rates, as well as market volatility and unpredictability (Broughton, 2022). M&As may not guarantee success because more than 50% of deals fail, particularly in terms of cultural clashes (Seth, 2021). The metaphor of catastrophic fire can be viewed as the people and cultural factors that significantly influences M&A success or failure rather than the business factor (Teerikangas & Hassett, 2022). Such fire may also be contemplated as the problem of incompatible corporate cultures or subcultures in an organization that leads to cultural clashes and more complicated conflicts (Seth, 2021).

Corporate cultures and subcultures, incompatible or not, inevitably co-exist with all work units in organizational settings. Organizational subcultures naturally emerge from different functional groups, locations, structural roles, responsibilities, positions, abilities, hierarchical levels, gender, age, and so on (Schein, 2017). Those different subcultures interact with each other in an organization, simultaneously leading to cooperation and conflicts, which affect organizational performance (Stangor, 2016). Consequently, the subculture is the relatively diffuse social network in an organization having a shared identity, distinctive meanings of ideas, practices, and objects through functional groups, structural roles, and locations (Hatch & Cunliffe, 2013). Essentially, subcultures can impact corporate culture complexity and the new culture that organizational leaders are creating (Lee et al., 2015). Hence, there is room for research to study the hidden factors influencing people interaction and cultural change management in an M&A organization. It is important for organizational leaders and human resource (HR) professionals to understand more deeply the fluctuating situations in global M&As and challenges in order to support successful integration.

This study presents a way of understanding the interaction of subcultures in M&A phenomena through the natural-science lenses: quantum physics, chemistry, and biology. Using metaphors oftentimes helps to enhance our cognitive ability to capture a complex picture (Thibodeau et al., 2019). The main objective of this paper is to employ comparative concepts between natural science and social science in order to form a metaphor analysis.

In a nutshell, this study provides three significant contributions. The first has been made by applying cross-pollination research between scientific and social views for new perspectives to examine the organizational context. The second contribution is made by presenting a better understanding of natural characteristics in M&A phenomena through nature. The last contribution discussed development mechanisms in people and organizational cultures and subcultures for change management. The findings, discussion, and implications are provided to help researchers, practitioners, and leaders to support M&A success in organizational change management.

Research Questions

The authors studied the underexplored perspectives of M&A phenomena from the triangulation of scientific views and understanding of employee development needs from the aspects of subcultures and corporate culture in an M&A organization. The authors sought to answer the following research questions (RQs):

RQ1: What are the emerging insights in M&A phenomena from the triangulation of scientific views of quantum physics, chemistry, and biology?

RQ2: What are the employee development needs to support effective interactions among subcultures in M&As?

RQ3: How does the triangulation of scientific views play a part in learning design to support employee development in M&As?

Theoretical framework

“The whole is more than the sum of its parts.” – Aristotle (Mazzocchi, 2008)

According to rapid technology, digitalization, and sustainability today, organizations face more complex and paradoxical situations (World Economic Forum [WEF], 2023). It is very challenging for human resource practitioners, leaders, managers, and scholars to change or adjust how they see, think, and do things to cope with internal and external pressures (Deloitte, 2023a). Managing people and organizational change is not simple because organizations can be defined as complex systems comprised of cooperative subsystems, such as the physical environment (e.g., units, locations, machines), the social environment (e.g., contact, collaborative activities), and individuals (e.g., dominant characteristics, groups of persons) (Czarniawska, 2013).

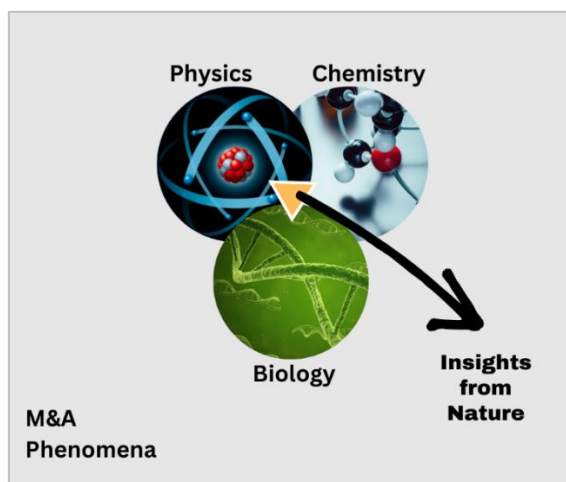
Systems theory tells us that the interactions among subsystems impact the structure of the main system and subsystems at both opening and closing states (von Bertalanffy, 1972). Ruona and Lynham (2004) emphasized applying a systems perspective of philosophy to people development with the three interacting components of ontology (beliefs), epistemology (thoughts), and axiology (practices) to enable a deeper understanding of organizations and to engender a fresh view of human resource (HR) methodology and techniques. Furthermore, applying the multiple-paradigm approach to research helps scholars and practitioners to broaden their views on phenomena (Grosskopf & Barmeyer, 2021). It also enables the interchange between

the functionalist and interpretive paradigms for a more holistic perspective and deeper insights (Ruona & Lynham, 2004) of complex and paradoxical organizations. Therefore, the multiple-paradigm approach to research means the openness to employ multiple paradigms to obtain the best understanding from looking into several perspectives surrounding phenomena for knowledge enrichment and innovative outcomes (Grosskopf & Barmeyer, 2021).

According to scientific views, three major knowledge foundations in science education—physics, chemistry, and biology—have been taught in institutions for many years (Doğan et al., 2023). Integrating multiple scientific views into a study in advanced sciences has seen the emergence of new fields of knowledge and breakthrough technologies (Bayda et al., 2019). For instance, the newly emerged knowledge of microfluidics used in electronic device manufacturing stems from the combination of physics, chemistry, biology, fluid dynamics, microelectronics, and material science (Niculescu et al., 2021). In addition, because the current global warming problem has become more complex, a better understanding of multi-component interactions as a whole system requires comprehensively integrating different scientific (physical, chemical, and biological) and social views (Fan et al., 2021). Hence, having a multidisciplinary view becomes helpful for coping with increasingly complex factors.

“Look Deep Into Nature and Then You Will Understand Everything Better”
(Albert Einstein Quotes, n.d.).

Figure 2 shows the theoretical framework that this study has proposed to guide the research design for understanding M&A phenomena. The three scientific views of physics, chemistry, and biology represent three paradigms that bring multiple perspectives to look more deeply into M&A phenomena. The findings from these three scientific views are new insights that augment the current knowledge about organizational change management in M&A integration.

Figure 2 Theoretical Model from a Scientific Multiple-paradigm Approach

Literature Review

Organizational Change Management in M&As

M&As are a risky strategy that more than 50 % of M&A deals fail because of cultural clashes between two companies during the integration (Seth, 2021). Ethics-based change management in M&A phenomena is vital for facilitating communication to create mutual understanding, particularly among subsidiaries/subcultures and corporate culture (Mak et al., 2017).

Sarala et al. (2019, p. 308) suggest that managing people in M&As requires more attention to “(1) multilayered identity dynamics, (2) emotional processes, (3) participation and change agency, (4) resistance, (5) HRM practices and tools, and (6) new forms of communication in M&As.” The people of a subculture form and maintain their group’s identity through members’ interactions and social networking (Hatch & Cunliffe, 2013). According to the social identity theory posited by Tajfel and Turner in the mid-1990s, those interactions are influenced by people and group comparisons that result in conflicts through us vs. them dynamics (Yildiz, 2016). Consequently, different perceptions among subcultures and the corporate culture in an organization lead to expected behaviors and responsibilities that also may lead to conflicts (Hall et al., 2018).

On the other hand, subcultural group leaders are expected to utilize those differences to support organizational learning (Wolf et al., 2021). Many learning and development interventions have been used in M&A organizations as a change management tool, such as team building, awareness training, cross-cultural training, and coaching (Thakur et al., 2016). Schein (2017) offers the concept of a cultural island as an organizational-learning tool for managing multicultural groups that helps to create a psychologically safe space and social interaction forum for employees to have open dialogue, to share experiences, and to explore self-assumptions for a better understanding of themselves and others and better collaboration among subcultural groups. Additionally, the World Café method, first introduced in 1995 by J. Brown and D. Isaacs, is another participatory tool widely used in organizational change processes for increasing participation, gathering qualitative insights, facilitating dialogue, creating mutual learning, and motivating participants to respond (Löhr et al., 2020). These learning concepts and tools help to increase employee cohesion and collaboration from positive emotional attachment within an organization (Stangor, 2016). Despite having concepts and tools to help with M&A collaboration, using insights from the scientific metaphors described below may broaden managerial horizons regarding how to handle disorienting situations.

The Quantum Perspective for M&As

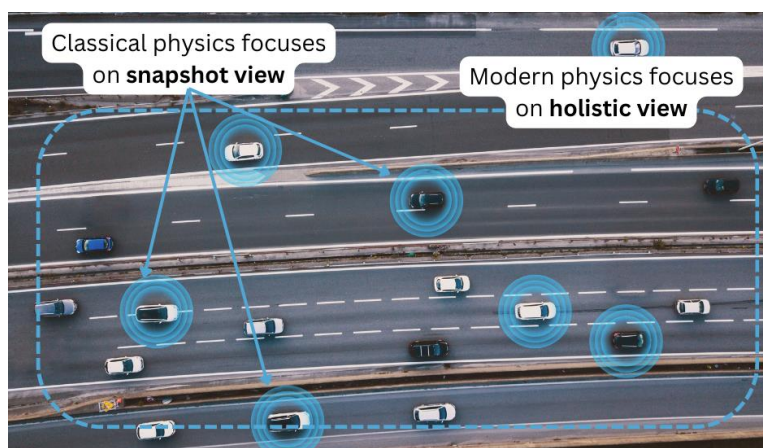
When the breakthrough of quantum theory took place in modern physics, there was a big paradigm clash with classical physics. Two well-known scientists of the 17th and 20th centuries: Sir Isaac Newton and Albert Einstein, studied classical and modern physics, respectively (Gamow, 1966). During this 200-year gap, the discovery in modern physics, such as quantum theory, had a massive clash with classical physics, such as Newton's three laws of motion. Modern physicists focus on the relationships of things (invisible matter and complex situation) while the classical physicists focus on the movement of a single object (visible matter and linear situation) (Humphrey et al., 2015).

The unified approach in quantum chemistry, however, shows the co-existence of classical and modern physics in the system. It complements classical physics but contrasts it by focusing not on object motion—a snapshot view but on entire energy

fields—a holistic view (Cook, 2008). Figure 3 shows a metaphor example of the co-existence of classical and modern physics in the system in daily situations. Classical physics is applied to observing or measuring a car. Meanwhile, modern physics is used for holistic observation, in which surrounding cars also affect each car's movement.

Quantum theory describes the relationships of things according to the wave-particle duality, and the energy exchange within sub-atomic states. The wave-particle duality is a fundamental theory of quantum physics that explains light, or an electron, exhibits both wave and particle properties. It behaves as a wave when there is no measurement; in contrast, it acts as a particle when being measured. This phenomenon is known as the observer effect (Humphrey et al., 2015).

Figure 3 A Metaphor of Co-existence of Classical and Modern Physics in the System in Daily Situations



Comparing wave-particle duality and energy exchange, subcultures and corporate culture co-exist within an organization (Schein, 2017). People from different work units interact and exchange energy with one another through the corporate-culture framework. Sometimes, employees experience a phenomenon during a certain period and remember it as snapshots. Oftentimes they have difficulty understanding such social phenomena holistically. In an organization setting, people come from all walks of life and act freely in groups or individually. Organizations use various measurements as observers (e.g., key performance indicators—KPIs) to detect and modify employee behaviors (Uddin et al., 2021). Reducing the degree of command,

control, and monitoring would minimize observer effects and allow employees to unleash their better potential and performance, including the encouragement of innovation in organizations.

Furthermore, the quantum theory engenders a new way of thinking about phenomena through a holistic view of objects, information, and all interactions in an energy field, not just individual objects (Bohm, 1980). The interactions and relationships in the system can be explained by the EPR paradox (EPR: Einstein Podolsky Rosen)—the observation and measurement of particle spin orientation with three key points (Humphrey et al., 2015):

(a) The paired electrons in a single event (two-particle wave function) spontaneously spin in opposite directions. There are only two directions of electron spinning, called up or down.

(b) Quantum entanglement is a tight correlation of paired electrons that can stretch over a vast distance. When an electron is observed or measured in its spinning direction it shows the result; another electron spinning can be known suddenly with 100% certainty.

(c) Superposition posits that both paired electrons have equal spinning up or down opportunities. Therefore, all possibilities exist without an observer or with no measurement.

Researchers look at human behaviors in subcultures through the lenses of the EPR paradox. First, the opposite spinning of electrons can be compared to the conflicting goals in an organization. Sales managers are groomed to be fast to tackle their targets (Gartner, 2019), while production and quality control employees may be reluctant to deliver the products not up to the standard (Lee et al., 2019). Conflict normally arises because of the contrasting goals or targets given to people that are hired to deliver different functions.

Second, quantum entanglement reveals the tight connection between corporate and subsidiaries in an organization, no matter how far and long apart they are; they are perfectly entangled with each other. The challenges in aligning the conflicting goals of different work departments (such as production vs. quality departmental goals) for check and balance, particularly in the industry 4.0 era (Lee et

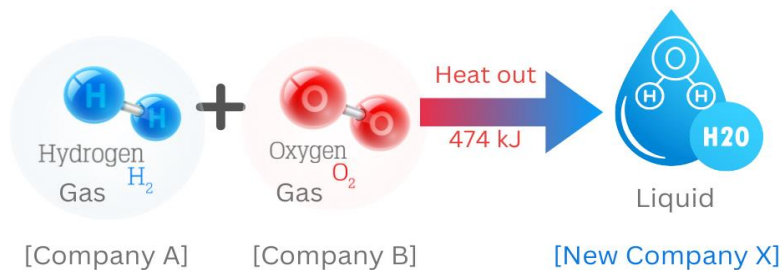
al., 2019), can be viewed through this quantum entanglement. If one electron is measured according to the observer of the spin state, we simultaneously know the outcome of another. Therefore, the alignment of conflicting goals in an organization should reflect the working status of those different departments whenever one of them is recognized to be facing change. This infers that understanding the natural conflict polarities in an organization offers the ability to predict situations and to apply appropriate approaches to manage M&A.

Lastly, regardless of the measurement, both paired electrons have equal spinning up or down opportunities. Those spinning opportunities, when flying along, are known as superposition—the phenomenon of paired electrons where each can move apart anywhere regardless of the distance and without knowing exactly the position of the other, reflecting tremendous different views/realities of each electron (Humphrey et al., 2015). Comparatively, employees from different backgrounds working in a dynamic organization that has been through M&A processes may form different working paradigms and embark on various different functions, subsidiaries—even countries far away from one another. The quantum theory, furthermore, suggests that even though electrons in the molecular bonding area move apart, they constantly influence each other (Humphrey et al., 2015). In line with the organizational change study, Huang (2022) has suggested that perceived organizational support positively influences employees' attitudes and participation during change processes. A comparison here for the organizational setting is that HR/policy management between the headquarters office and subsidiaries always influences each other despite the far distances. Conversely, the change in one subsidiary, even a tiny one, may also affect the other one(s) significantly.

A Chemical Reaction in M&A

Phaopat and Pruetipibultham (2018) applied a cross-pollination approach between social and scientific knowledge to explain M&A phenomena through the chemical bonding metaphor. They mixed the social view of systems theory (von Bertalanffy, 1972) and subculture and organizational culture (Schein, 2017) with the scientific view by using the chemical reaction of water as a metaphor for M&A (Figure 4).

Figure 4 The chemical equation for water formulation as a metaphor for M&A, adapted with permission (McMahon et al., 2017; Phaopat & Pruetipibultham, 2018)



On the left of the chemical equation of water formation, Figure 4 shows hydrogen gas [Company A] and oxygen gas [Company B] representing the two companies (two subcultures) prior to merging. On the right of this equation, water represents the new company X (main/corporate culture), which the management expects to achieve after integration. The 474 kilo-joules are the energy released from this reaction into the environment as heat that makes the reaction move forward. This heat represents a negative side-effect of integration (e.g., restructuring, downsizing, layoffs). Since water formulation is very dangerous at room temperature, Phaopat and Pruetipibultham (2018) pointed out that improperly handling the chemical reaction could lead to an explosion. The released heat energy (474 kilo-joules) transferred to the surrounding environment is known as enthalpy in the scientific field. This enthalpy describes the reaction in terms of “heat-out”—rendering the environment hotter (McMahon et al., 2017). It indicates that when massive organizational restructuring is required, handling side effects on employees’ emotional responses to changes is essential. The emotional and psychological impacts should be embraced as a part of change management.

Meanwhile, the new H-O bonding is invisibly changed, and the visible physical property of the new product (water) in this reaction has been changed totally from the initial substances (e.g., from gas to liquid). The H-O bonding distance infers the relationship gap between a corporation and subsidiaries, also among subsidiaries. The relationship gap must be appropriately maintained in order to support healthy relationships between the corporation and its subsidiaries; it is unnecessary to force all

to cultivate the same culture, which means that various subcultures can grow with some alignment with the corporation.

In addition, a cross-pollination study about emotion (Hirsh et al., 2012) integrates the scientific view (thermodynamics and information theory of entropy) and the psychological view to explain that uncertainty-related anxiety is associated with a self-organizing system; the system naturally adapts to external environmental changes by minimizing internal entropy at a manageable level—a process known as psychological entropy. Therefore, with high entropy (a high degree of disorder), the system accelerates change in order to minimize the disorder. Likewise, if emotions in the human mind (emotional energy) are high, people will tend to be driven to change or do something to minimize the disorder/confusion. In organizational management, the concept of emotional intelligence of Daniel Goleman, the ability of an individual to handle distressing emotions (e.g., anger, fear, and anxiety) in self and others, is recognized as a more powerful function than intelligence quotient (IQ). The emotional quotient (EQ) affects all aspects of life, such as decision-making, socializing, and professional work (Brown et al., 2018).

Biological Adaptation to the Environment

Biology is the natural science of life and its compositions, such as animals, plants, organs, cells, and biochemicals. This field of knowledge explains the elements, structures, functions, mechanisms, growth, and evolution of living organisms. Organisms have genes, the sequence of DNA elements, as their blueprints that are used to construct cells, tissues, and the organs of organisms. Epigenetics is a modern study of genes (internal organism factors) that are influenced by external factors (the surrounding physical and energetic environment), resulting in distinct gene expression and regulation in cells (Nerlich et al., 2020). Figure 5 depicts epigenetics in animal adaptation to the environment resulting in permanent gene expression.

Figure 5 Epigenetics in Animal Adaptation to Environment Resulting in Distinct Gene Expression and Regulation in Cells



In addition, external factors impact gene change. For example, according to a longitudinal study, whole-genome bisulfite sequencing has been changed and ingrained by maternal smoking over the life span. Prenatal exposure to tobacco smoke results in genetic changes in mothers and children, including potential effects on the development of phenotype—individuals' characteristics of organisms manifested by gene manipulation (Bauer et al., 2016). Furthermore, daily food intake profoundly influences the circadian system and the clock genes in energy metabolism, particularly the nutritional challenges of fasting, caloric restriction, high-fat, and ketogenic diets. The circadian clock system detects the body's health or nutritional state for adapting to the environment. While the feeding-fasting cycle (meal timing) is a key factor, the nutritional composition is a guideline of the clock system (Sato & Sasson-Corsi, 2022).

In the biological metaphor, if the genes are the organism's master plans, M&As are a strategic business plan. When the environment dominates genes, those genes must adapt to their surroundings. Similarly, the M&A execution blueprint should be designed to deliver adaptive plans along with organizational changes. The change management approach in an M&A organization is comparable to the feeding-fasting program—the increases of resources, information, and customer bases or massive/minor layoffs, and the cut down on capital and important resources, impact organizational dynamics. Metaphorically, the circadian clock system detects the body's nutrition state, and the M&A organization should have an HR intervention to monitor

the emotional/operational state corresponding to the managerial decisions during the integration phase to adjust strategically and in a timely way.

Epigenetics offer the idea that existing genes can be modified by the environment (Bauer et al., 2016; Nerlich et al., 2020; Sato & Sasson-Corsi, 2022). Metaphorically, the appropriate environmental design of the organizational setting can support desired expression and outcomes naturally as well. As epigenetic changes can be heritable, organizational design can “learn” in the sense of what to pass down from one generation to the next. Essentially, understanding epigenetic mechanisms enhances the knowledge of aging and disease. Likewise, understanding the characteristics of subcultures or subsidiaries provides important guidelines for designing successful M&A integration.

In summary, the three scientific views reveal hidden factors in organizational change management, such as unspoken emotions, climate and cultural ecosystem, and tangible and intangible relationships. Handling change processes at three levels of organization, group, and individual needs contextual understanding, holistic perspective, and specific intervention designs for each level. Therefore, the multiple-paradigm approach in this study offers a way of discovering and understanding those hidden factors.

Research Methodology

The authors applied multidisciplinary approaches in the research design with multiple-paradigms, metaphor analysis from the literature, and in-depth semi-structured interviews. Three scientific views of physics, chemistry, and biology representing the multiple-paradigm approach (Grosskopf & Barmeyer, 2021; Ruona & Lynham, 2004) were used in this study. Metaphor analysis (Stanley et al., 2021) was applied to the literature review related to scientific and social views about organizational contexts in order to reveal insights and to gain a better understanding of M&A phenomena from a natural perspective.

The authors used three methods (transferability) for obtaining data to increase trustworthiness: semi-structured interviews, strategic conversations, and fieldwork materials (Glesne, 2016). The in-depth semi-structured interviews were conducted in a

M&A organization in Thailand. This organization is a multinational company in the electronics manufacturing business that has been through M&A integration four times during the past 36 years. The current owner is German, while the former owners were American and Japanese. There were 21 employees from five strata (hierarchical levels) and different departments that participated in these interviews (four individuals and four focus groups). There were 9 men and 12 women with the work tenure of 5 to 32 years. Schein's (2017) model of organizational culture was used for developing the semi-structured interview questions and to answer RQ2 (What are the employee development needs to support effective interactions among subcultures in M&A?). Examples are: "What are the key identities of other business units/departments and yours, and how are they similar or different?," and "What are the factors that help employees from different business units/departments have the willingness to work together smoothly?"

The thematic analysis process (Saldaña, 2013) was applied to all transcripts generated from a 60-90 minute in-depth interview session. The authors analyzed through reflection themes related to employees' concerns in M&A integration and then the development needs for them were identified. The authors sent those employee development needs to company representatives for the member checking step in order to verify the results (credibility and confirmability) and to ensure trustworthiness and accuracy (Glesne, 2016).

The authors incorporated the results from metaphor analysis and themes from in-depth interviews to find linkages and answer research questions. The findings are presented in the following section.

Findings

Insights Regarding M&A Phenomena

To answer RQ1 (What are the emerging insights in M&A phenomena from the triangulation of scientific views of quantum physics, chemistry, and biology?), the key theme from the metaphor analysis from the literature was people-entropy management through epigenetic relationships in M&A phenomena.

Table 1 Metaphor Analysis from the Triangulation of the Scientific Literature

Triangulation of scientific views	Example quotes from literature review	Sub-themes
Quantum physics	<p>“It complements classical physics but contrasts it by focusing not on object motion—a snapshot view but on entire energy fields—a holistic view.” (Cook, 2008)</p> <p>“Quantum entanglement is a tight correlation of paired electrons that can stretch over a vast distance.” (Humphrey et al., 2015)</p> <p>“...paired electrons in a single event (two-particle wave function) spontaneously spin in opposite directions.” (Humphrey et al., 2015)</p>	<p>Integrating snapshot and holistic views to understand all realities in phenomena</p> <p>Great alignment invisibly</p> <p>Acceptance of natural conflicts which cannot be avoided</p>
Chemistry	<p>“...high entropy (a high degree of disorder), the system accelerates change in order to minimize the disorder.” (Hirsh et al., 2012)</p> <p>“...new H-O bonding...the visible physical property of the new product (water)...has been changed totally from the initial substances.” (Phaopat & Pruetipibultham, 2018)</p> <p>“H-O bonding distance infers the relationship gap... The relationship gap must be appropriately maintained.” (Phaopat & Pruetipibultham, 2018)</p>	<p>Dare to deal with people’s negative emotions to reach psychological safety</p> <p>New roles and responsibilities in new organization</p> <p>Maintain and utilize the relationship gaps</p>
Biology	<p>“Epigenetics...genes ... are influenced by external factors..., resulting in distinct gene expression and regulation in cells.” (Nerlich et al., 2020)</p> <p>“While the feeding-fasting cycle (meal timing) is a key factor, the nutritional composition is a guideline of the clock system.” (Sato & Sasson-Corsi, 2022)</p>	<p>Building new permanent behaviors toward environmental changes</p> <p>Need for interventions to adjust the whole system</p>

According to the theoretical concept in this study, those three scientific views help a learner to seek a greater understanding of the relationships of visible and invisible things in nature. Quantum physics offers multiple views (snapshot and holistic) on a situation. Chemistry presents side-effects of combination in terms of organizational temperature. Biology provides insight into the ecosystem or environmental setting's impact on long-term or permanent changes. Comparing such scientific knowledge to that in organizational phenomena gives leaders and researchers more profound insight into the visible character of their organizations. Additionally, handling the appropriate surrounding environment is an essential factor that supports the M&A process to move forward and to be “on plan.” Therefore, the insight into the relationships in nature demonstrates that visible things (e.g., the color and shapes of substances, substance properties, movements, behaviors, organizational performance) are actually produced from invisible things (e.g., molecular bonding in natural science, and values and beliefs in sociology).

Learning Design for M&A Integration

To answer RQ2 (What are the employee development needs to support effective interactions among subcultures in M&A?) and RQ3 (How does the triangulation of scientific views play a part in learning design to support employee development in M&A?) through in-depth interviews, key themes of employee development needs and learning mechanisms emerged to support employees in coping with organizational changes during the integration process.

Example quotes related to employee development needs:

“I think I am having difficulties dealing with priority. For example, when I got a business request from Department A and B at the same time, I wouldn't know how to proceed. So, I let them discuss among themselves and it ended up in a conflict.” (Manager#8)

“We need to understand our common goals and much more communication when we work across departments.” (Junior Manager#11, 12)

Table II incorporates the findings from the metaphor analysis and interviews—employee development needs and learning mechanisms in M&A.

Table 2 Learning Mechanisms in M&A Correspondence with Employee Development Needs and Metaphor Analysis

Metaphor Analysis (sub-themes)	Employee Development Needs	Learning mechanisms
Integrating snapshot and holistic views to understand all realities in phenomena	Need to understand organizational history (several rounds of M&A in the past) and repercussion of changes	Self-reflection, exploring, and exchange experiences to develop intuitions, feelings, thinking, and sensing through storytelling/journey maps (Bridges & Bridges, 2019)
New roles and responsibilities in new organization	Need to understand perception alignment (why/what/where/how) of the new roles and responsibilities after M&A	Experiencing seeing both similarities and differences in attitudes and behaviors among members of the in-group and out-group from the same and different locations (e.g., world café, cultural island) (Schein, 2017)
Great alignment invisibly building new permanent behaviors toward environmental changes	Need to understand common goals and collective work behaviors after role & responsibility adjustment	Exchanging ideas and opinions without judgement (a dialogue forum) through informal/formal platforms and collective discovery for constructive mindset Exchanging personal values and intentions on certain work projects rather than sticking to just observed behaviors. This can be done through awareness training and dialogue (Bohm, 1980)
Dare to deal with people's negative emotions to reach psychological safety Need for interventions to adjust the whole system	Need to understand relationship management within and across teams	Experiencing trust and fear through simulating situations (through corporate case studies) to explore psychological safety through coaching process/team building Self-reflection on feelings and behaviors that influence trust and fear (Mak et al., 2017; Stanford, 2013)

Metaphor Analysis (sub-themes)	Employee Development Needs	Learning mechanisms
Maintain and utilize the relationship gaps	Need to understand how to communicate for connections and collaboration across teams	Training on listening and empathy skills to understand others and to let others understand oneself at a deeper level
Acceptance of natural conflicts which cannot be avoided	Need to understand conflict management	Practicing observation skills to communicate fact rather than making judgments (Mak et al., 2017; Stanford, 2013)

The learning mechanisms above are guidelines for designing and developing interventions, training programs, and activities related to the M&A integration process, particularly regarding the people and cultural dimensions. Not only HR practitioners, but leaders and managers can also use this triangulated concept of employee development needs, metaphor analysis, and learning mechanisms to understand, discuss, and develop change activities to facilitate a successful M&A process.

Discussion and Recommendation

M&A strategies have been used as a management tool to sustain and grow business. Regarding today's global disruptions, the M&A process cannot guarantee its success. The need for new lenses to look at the complex issues is essential. The findings reveal beneficial insights for M&As from looking deeply into nature. A better understanding of natural characteristics, essential conflicts for checks and balances, and the adaptation of living organisms will lead to new perspectives in organizational management and development.

This study offers managerial guidelines to increase the opportunity for successful M&As regarding people management. First is understanding natural conflicts and welcoming unpredicted conflicts rather than avoiding or suppressing them. The management team should prepare to accept both predictable and unpredictable conflicts between the corporate culture and subcultures/subsidiaries as conflicts naturally occur due to the fact that each social unit is created to deliver different outcomes from others. Leaders can also utilize subcultural differences in building

competitiveness, boosting innovation, and supporting organizational learning in their organizations. Therefore, emotional awareness and diversity acceptance are vital competencies for managing uncertainty, coping with conflict, and turning crises into opportunities.

Second, allowing subsidiaries sufficient autonomy and minimizing the measurement effects—such as setting too many KPIs or using a command-and-control approach—are important. Providing sufficient autonomy maintains organizational health instead of creating more crises. Furthermore, cultivating innovative behaviors and increasing employee engagement are essential for handling environmental entropy.

Lastly, designing interventions or activities that can detect employees' emotions and gather opinions simultaneously is vital. The inputs from those activities can provide insights for adjusting approaches and environment settings in the organization, which support change management and organization development. Furthermore, people-oriented interventions create positive subcultural interactions and bridge the gap between the corporate culture and subcultures. Finally, this results in healthy relationships among the organizational members as corporate activities usually provide forums for collecting stories and building people connections (Stanford, 2013).

Implication

The change and transition from old to new organizations in M&As are difficult for employees because they tend to cling to past experiences and perceptions (Bridges & Bridges, 2019). Therefore, employee assistance programs such as training, coaching, dialogue forums, and psychological safety space can help them move forward. The theoretical and practical implications of the findings are discussed in the following sections.

Theoretical Implications

This study has expanded research methodology and design in qualitative study by adopting the cross-pollination of knowledge among scientific theories in social phenomena to offer a new way of theory building related to organizational research. Adopting a multiple-paradigm approach has led to an increasingly holistic view of phenomena and the seeking of multiple factors in relationships of intercultural-

situations to answer research questions (Grosskopf & Barmeyer, 2021). Furthermore, conceptual metaphor theory (CMT) of G. Lakoff and M. Johnson supports the finding that people use metaphors to shape thinking processes to gain a deeper understanding of complex situations and to develop cognitive behaviors (Thibodeau et al., 2019).

Natural science is accepted as being bias-free; meanwhile, social science researchers need to be aware of the degree of their bias in order to enhance trustworthiness and research quality from a pragmatic point of view (Maarouf, 2019). Rose and Johnson (2020) have emphasized that trustworthiness is a significant component of research, both in natural and social science, and in qualitative and quantitative studies. Designing research in social science is like chemists designing their experiments. Scholars can apply the methodology in this study; multiple paradigms, metaphor analysis, and in-depth interviews into their research design.

Regarding Heidegger's theory of truth, Huttunen and Kakkori (2020) contended that incorporating people's perceptions of reality into scientific approaches helps social science researchers to obtain a deeper understanding of their studies and to improve trustworthiness.

Practical Implications

Leaders and HR professionals must plan for strategies to serve unexpected challenges and changes. M&As are an example of organizational strategy designed to handle the complicated nature of the business environment; they are inarguably used to help organizations adjust for the new frontier of technology, digital transformation, and sustainability (WEF, 2023). However, M&A organizations face problems in business and people dimensions during the integration process. This study offers a way to handle the people dimension by first understanding problems (employee development needs) and then solving them with proper learning interventions.

Nevertheless, understanding the processes and consequences of M&As may be quite difficult, given that the processes involve a great deal of emotional entropy from group attachment and detachment. Adding refreshing views from the scientific paradigm into social-science-based phenomena open up the practitioner's worldview. For leaders, HR professionals, as well as scholars, utilizing synchronized snapshots and

holistic views to manage change in the M&A process with tools and process designs will help to achieve successful integration.

In addition to the M&A strategies and learning mechanisms, handling cultural issues and transformation in M&As is not only HR's responsibility but also leaders and followers have to contribute to the facilitation and participation in organizational change processes. Cultivating and maintaining a culture of lifelong learning are vital for organizational readiness (WEF, 2023) to cope with future changes.

Limitation and Future Research

First, regarding the high level of confidentiality in M&A organizations (Bansal, 2020), the number of organizations and participants in the present study was limited. The authors suggest collecting more data from other M&A organizations and industries for better generalizability (Creswell & Creswell 2018). Research collaboration with organization insiders would help to access M&A organizations and to obtain further information.

Second, applying multiple paradigms in a study is not simple, and sometimes it is very difficult or impossible. According to the concept of Khun's paradigm shift, Anand et al. (2020) advocated that the conversation gaps among researchers or even practitioners are roadblocks to paradigm shifts because they tend to keep holding to their paradigms and old experiences for debating rather than seeking to understand the complex or contradictory issues in their fields. Many researchers use a single paradigm as a research instrument method, but they fail to realize the importance of shifting paradigms toward building better theories.

Conclusion

New perspectives on organizational change management in M&A phenomena were examined in the present study through a multiple-paradigm approach and in-depth interviews in a multi-national company experiencing intensive M&A integration. The authors reviewed the literature on organizational change management in M&As and three scientific views (quantum physics, chemistry, and biology) representing multiple paradigms. Additionally, metaphor analysis from natural views was applied in order to gain deeper insights into M&A phenomena. Specifically, the people-side concerns the

relationships between subcultures and the corporate culture and how they influence the success or failure of M&As.

The results from the metaphor analysis and in-depth interviews highlight the need for people-entropy management, employee development needs, and learning mechanisms for coping with M&As as radical change in organizations. The theoretical implications in this study offer new ideas to increase the quality of qualitative research using a multiple-paradigm approach. The practical implications can guide leaders, HR professionals, and scholars on how to conduct organizational change management in complex situations by integrating snapshot and holistic views to support the implementation of management tools for successful outcomes.

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