Available online at www.ijournalse.org

Emerging Science Journal

(ISSN: 2610-9182)

Vol. 7, No. 3, June, 2023

STEM Talent: A Game Changer in Organizational Digital Transformation

Piyawat Jriyasetapong [1*], Supaporn Kiattisin [1], Smitti Darakorn Na Ayuthaya [1]

[1] *Information Technology Management, Faculty of Engineering, Mahidol University, Nakorn Pathom 73170, Thailand.*

Abstract

Although organizational digital transformation (ODT) is implemented globally, Thailand and the Lao People's Democratic Republic do not possess the right factors for success under the tech-no-socio-economic paradigm. Organizations must modernize their capital resources, particularly their talent, in order to become agile, competitive, and resilient in the digital era. In this research, we identify and validate by proposing talent success factors and a framework for enabling and promoting ODT in Thailand and the Lao People's Democratic Republic. The statistical population consisted of 410 individuals who were observed in their digital businesses. Confirmatory factor analysis (CFA) shows that a four-factor model fits. The most influential factor for ODT was found to be transdisciplinary ontology talent (TOT), followed by mental model talent (MMT), enterprise architecture talent (EAT), and strategic agile talent (SAT). The findings demystified the four factors, entitled "STEM talent," in a comprehensive framework and its artifacts while explaining their respective influences. The article proposes a STEM talent and its framework for ODT with high potential, including but not limited to Thailand and the Lao People's Democratic Republic.

Keywords:

Strategic Agile Talent;
Transdisciplinary Ontology Talent;
Enterprise Architecture Talent;
Mental Model Talent;
Organizational Digital Transformation.

Article History:

Received:	06	January	2023
Revised:	15	March	2023
Accepted:	19	April	2023
Available online:	10	May	2023

1- Introduction

Technology and creativity were viewed as a cyclopean scale for progress in the Marxian and Schumpeterian paradigms, but Solow repeated temporal regularities as neighborhoods of equilibrium until dynamic disequilibrium [1, 2]. The Fourth Industrial Revolution (IR 4.0) is a digital revolution brought on by technological advancement and characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). VUCA is shown by how fully digital capabilities are used to create value and a competitive edge in the new economy [3-5]. In the techno-socio-economic paradigm, transdisciplinary knowledge production and demystification would drive people to improve personally and create professions in coevolution [6, 7]. Economic prosperity hinges on a nation's capacity to attract and retain top STEM talent (STEM). STEM competencies are mental aptitudes, know-how, and abilities relevant to the STEM ecosystem, most notably the workforce, that enable economic competitiveness [4, 8]. According to the annual report of IMD's world digital competitive ranking, which defines the nation's competitive factors and sub-factors in terms of knowledge factor (talent, training, and education, scientific education), technology factor (regulatory framework, capital, technology framework), and future readiness (adaptive attitudes, business agility, IT integration) [9], while automation of routine tasks will increase the number of highly skilled workers, routine-intensive jobs will decrease [4].

VUCA worlds have unique dynamics and properties, usually measured in quantum shifts. They require entrepreneurial leaders and top management to focus less on traditional extrapolative planning, planning fallacy traps, or incremental change and more on strategic testing of numerous hypotheses underlying digital dynamism in the market,

* **CONTACT**: piyawat.jri@student.mahidol.ac.th

DOI: http://dx.doi.org/10.28991/ESJ-2023-07-03-020

especially new organizational innovative capabilities to pursue new business models [10–13]. This means that managers should be able to adapt to uncertainty instead of trying to control people by facilitating cooperation and decision-making [11]. Digital capital, often called techno-capital or information capital, is the convergence of digital competencies and technology, especially in improving intangible capital. As the digital landscape grew, items were built, utilized, and retired differently [14–16]. These include things that may be licensed for royalty income and brand equity. When internal resources and competencies are employed to develop market response strategies, particularly in the VUCA competitive scenario, value is created at the firm [12, 17]. Business models must be reinvented with a competitive frame and mental boundaries. Before a dominating design emerges, a capitalistic system must evolve and adapt. It's sustained by matching the industry's product value growth and engaging in domain interactions that compete, disrupt, or modify performance trajectories [10, 12, 18, 19]. Specific goals included the incorporation of process and variance theories, while configuration was defined by Wilden et al. [20]. By then, a specific set of goods and services – also referred to as ordinary capabilities – are manufactured and offered to utilize the finest industrial organizational structure currently in use. Important information is omitted, especially about managerial entitlement, resource allocators, and stakeholder stewardship [12, 19, 21].

A capacity theory encompasses a repository of resource competencies for the economy, a demystifying system of dynamic capabilities in organizations formalized by talent management (TM) architecture, as well as personal paradigms and abilities for visionary leadership and strategic reframing [12, 19, 22]. It ensures stakeholders provide the most value. The firm generates value when internal resources are used to respond to market opportunities and senior executives are involved who see talent as a competitive asset, talent management (TM) effectiveness, and leadership involvement [12, 17, 23]. The value of human capital embodies the firm's adaptability for competitive advantage and fundamental competencies concerning market dynamism, customer perspective, and related expenses. Value-driven processes include value creation, capture, leverage, and protection [17, 24]. Managers and organizations must modernize their management capabilities because while they may excel in static capabilities, notably in identifying competitive reference points, they fall short in dynamic capabilities. In a climate of extreme unpredictability, often known as Knightian chaos, or the edge of chaos, managers must be able to innovate and adapt [12, 19, 25].

Previous studies revealed that digital transformation can improve business performance [26]. Additional findings also confirmed that when a company implements information technology-based transformation, the company's competitiveness immediately improves [27–29]. However, it was argued that at the beginning of the transformation process, the financial performance declines [30]. Furthermore, the impact of digital transformation on employees is a rise in more work stress, which leads to a drop in firm performance [31, 32]. Also, business digital transformation is a challenging, complex process with a low success rate. Accordingly, it was found that only 11% of surveyed businesses are successful [33]. It could be related to a lack of research on digital transformation as it relates to people's skills and performance. To minimize this failure and transformation gap, it is important to further study talent success factors in order to deal with the risks of knowledge management, digitizing business processes, and changing business models [4, 34]. Hence, this study proposes a new approach to skill management for digital transformation strategy and eliminates the brittle organization. As a result, in a VUCA society, individuals are expected to become knowledge workers who can respond to real-world complexities by problem-solving and producing excellent solutions that are adaptable to an organization’s or an environment’s ongoing changes. In this paper, the research questions are therefore:

Q1: *What are the talent success factors of organizations towards digital transformation?*

Q2: *What is a structural model of the talent success factors?*

In response to these research questions, an ODT talent framework was created. Then, a systematic literature review, primary data collection from expert interviews, and confirmation factor analysis (CFA) were performed. The qualities that contribute to the ability of STEM talent were explained in depth in the literature review and methodology sections. In addition, confirmatory factor analysis (CFA) was used to verify the model's fit. The data were acquired through semi-structured interviews. This study aimed to pinpoint the talent-related success criteria for organizational digital transformation. The results of this study can be used to reinforce the digitalization of organizations in Thailand and the Lao P.D.R.

2- Literature Review

2-1- Organizational Digital Transformation

Technology fusion or transmission belt is the transformation of industries that were previously kept apart for macroeconomic reasons – to increase the economies of scope for unrelated industries as naturalized through cross-disciplinary interaction – also known as *network effects* by ICT experts [1, 11, 12, 22, 35, 36]. This is addressed by Nicolescuian Transdisciplinary (TD) perspectives, which are clarified by the fact that solidarity in plurality is a systemic incompleteness of reality, especially with reference to science, technology, and society. This caused a shift in the techno-

socio-economic paradigm toward a knowledge-based economy. This changed the job market because people now need to know how to work with machines.

To adapt to a digital business environment, a company's business model, architecture, procedures, and people are refreshed. Senior leadership is needed to drive change and incorporate it within the organization [14, 37, 38]. Digital transformation involves a major shift in mentality, method, and application, supported by investments in people, projects, infrastructure, and IT systems. Even if a traditional asset has some digital features, this might not fully use the power of technology [39]. Organizational transformation draws from evolutionism, punctuated equilibrium, and institutionalism. Organizational transformation approaches typically focus on four systemic themes: inertia in organizations, processes, agencies, and efficiency, as well as risk profiles and risk management [40]. The World Economic Forum and INSEAD reports on digital labor indicate that organizational transformation has replaced physical labor with computers, AI, and IT. Winners attract, hire, and retain employees who are technologically savvy [41, 42]. Dries [43] posits that value is the ability of a company's human resources to improve its competitive advantage and add to its core competence.

Behavioral economy highlights managerial challenges such as hubris, decision traps, rules of thumb, and irrationality. The psychological underpinning of behavioral science is psychology, which is defined as the scientific study of mental processes [44]. Economists have a theory of firm-level capabilities to address this. This notion encompasses strategy alignment, business model innovation, risk management, and organizational flexibility. All can affect a company's ability to transform into a new kind and frame [12, 19]. The three main components of a digital strategy are the digital process platform, the digital service platform, and an excellent operational backbone [45]. An effective digital strategy stems from a unique digital vision in the face of business volatility [11]. Open innovation involves both heuristic business model selection and technical strategic perspectives [46], and one of the most important ways to create development partnerships [47] is to empower and help those who have been left behind.

Product and process changes, especially dominant designs that have changed due to innovation across all industries and the concentration of digital, robotic, and biological technology, signify the end of the technological ferment age [8, 10, 22]. While digital transformation required more experience, a data-driven approach to the digital environment in all areas contributed to effectiveness and value in the lifecycle [14]. Digital transformation confronts executives in four areas: digital business models; digital operating models; digital talent and skills; and digital metrics. Digital leaders who adopt a lean approach to both core and support functions are essential to the success of an enterprise [48]. Information systems remain intimidating in today's dynamic decision-making environment. Therefore, it's important to regard architecture in terms of people, organization, and technology [49] as an adaptive complex system rather than a simple correlation that led to the misalignment [50].

While agility and an eagerness to learn new things are essential in a data-driven culture, establishing digital capital in organizational digital transformation are critical [51]. While transdisciplinary [6, 7, 52] highlights continuous learning in managing complexity, problem-solving, and a greater degree of abstraction for epistemology, not just own professions, with interdisciplinary pertinence [4], there is inherent uncertainty about its compatibility with an exponential mind-set or its ability to reconcile borderless bounds.

2-2- Dynamic Capabilities

The best-practice industrial organization schema supports the creation and marketing of a range of goods and services, called ordinary capabilities. It lacks managerial entitlement, resource allocators, and stewardship of many stakeholders [12, 19, 21], whereas the strategic agency's skill level is key [53]. Employing their potential and the appropriate technology [54, 55] is a required adaptive capability to make seamless executable plans in the digital revolution era.

Dynamic capabilities support the premise that wealth arises from invention and creativity as the driving force behind current economic progress [56]. Specialized capital collaborates with other capital to use and aggregate ICT capital convergence toward value-adding intangible assets [15, 57]. Dynamic capability uses configuration theory with routines with variables as an architectural model to direct the evolution of a firm's resource configuration using a path-dependent technique to produce alternative resource configurations and operational routines [13, 19, 58–61]. Instead of skills, which every information-intensive business must possess as the minimum least adaptive capabilities [3], the competitive advantage is in resource configurations that are developed and exploited over time [25]. While dynamic capabilities integrating configuration theories with process and variance methodologies are distinguished and incorporated with strategic management, DC micro-foundations, such as organization structure and culture, help achieve value performance as an orchestrated evolutionary fitness [20]. Dynamic talent capabilities are classified as individual TM, paternalized TM, and sophisticated TM, with the main key driver's casualty of digitalization [62].

The organization must adopt new technology to increase productivity and competitiveness [63]. IT drives strategy and company operations with foresight and an integral master plan. IT leveraging capabilities support and practice for reconfiguration in improvisation or dynamic capabilities, whether planning, essential, or ideal as Goodness to fit in the cyclical nature of adoption, continuation, and discontinuance, particularly new product development (NPD) [64-66].

Business-IT alignment (BITA) toward business-IT coevolution (BITC) through an EA approach in which business and IT are blurred, multifarious, and multilayered to communicate artifacts directly [50]. This is achieved by enterprise engineering and organization design, not simple deterministic logic.

Enterprise architecture represents an organization's future capabilities, governance, operation, application, data, and IT technologies through EA creation, life cycle, and organizational culture. EAM combines the goals of IT management, investment, strategy, and transformation [67]. Enterprise Architecture (EA) ensures enterprise-wide IT management and organizational transformation through architecture models, principles, capabilities, procedures, standard service, agility, and strategic alignment to support a company's business strategy [49, 68]. Successful strategy setting, management, and operational convergence with a solid governance framework will enable risk management in the digital ecosystem, help achieve corporate goals promptly, and function as an efficient investor with a major information architecture design [49, 67, 69].

Designing an enterprise architecture not only requires knowledge and understanding of these technologies but also an awareness of the aims and business strategies for designing and selecting technologies in enterprise architecture plans [70–72]. Therefore, the concept of enterprise architecture can consider the following: a) business strategy for a vision-driven architecture with the ability to design a business architecture in terms of what the business needs, uses, and solutions to drive; b) infrastructure, which is the first element to explore among the information technology structure used in the entire organization; c) applications supporting the organization's strategy, including specific and fundamental applications; d) data for all relevant data dimensions; and e) time.

A business process model (BPM) consolidates information with digital dynamism. Current BPM values and practices emphasize logic modeling (process), architecture integration (infrastructure flexibility), and procedure actor (mindful agency) [73]. Flexible and robust systems, or platform-based organizations with an elastic, cohesive, adaptable, and stable ecosystem, demonstrate excellent potential for innovation. Organizational culture is constituted of sharing information, constant change, hands-on entrepreneurship, and learning from mistakes [12, 19, 38].

2-3- Talent Value Management

In Anglo-Saxon institutions, talent is by definition a need for leadership [74, 75], whereas implied talent is an investment in the future generation of leaders [76]. Additionally, star performers are best fitted by a power law of distribution with their massive exponential performance-value functions compared by their tails [77], and star talent [78] may also be able to see potential opportunities that could result from changing business models, according to Sparrow & Makram [17]. This is while Whysall et al. [36] hold that an organization with a new focus on transdisciplinary networking has a talent shortage in its workforce.

Regarding the annual report from the IMD World Digital Competitive Ranking, the nation's competitive factors and sub-factors in the knowledge factor (talent, training and education, scientific education), the technology factor (regulatory framework, capital, technology framework), and the future readiness factor (adaptive attitudes, business agility, IT integration). Automation will eliminate routine jobs, which will increase the number of highly skilled workers [4]. Talent is an organization's strategic asset that can be used to create value. Talent could be a single elite person or a group of people with different skills [4, 12, 17, 21, 78], especially agility in learning and growth, as shown by the talent equation: competency x commitment x contribution [76].

Collings & Mellahi hold that talent management is a process in which crucial roles are identified, each contributing differently to an organization's sustainable competitive advantage [79]. While TM architecture focuses on frameworks, procedures, and artifacts, TM literature focuses on HR capital [17]. TM's strategy and practices must embrace company values [75]. RBV: Talent management is a source of competitive advantage and added value. This helps companies execute consumer and organizational policies [74]. TM must create value for the organization through a succession of value claims, where talents are recognized by value, rare, inimitable, and non-substitute (VRIN) capital passion. Non-HRM, RBV, capacity theory, and economic geography principles are collected and converted [17]. Positioning in the market is an nth-order derivative of competitiveness, and RBV gives you the ability to create new products dynamically [58, 80].

Barney offered a VRIN enhancement notion as a comprehensive framework with internal and external environment interlinkage in relation to RBV via the company's resources and capability to collect and mobilize valuable, rare, inimitable, and organizational resources (VRIO). It guides the analysis and evaluation of strategic resources with critical heterogeneity that can provide long-term competitive advantage. VRIO can help leaders and executives understand how KBV contributes to sustainable competitive advantage and mobilize valuable resources through a knowledge-based view [81-85]. VRIO fosters core competency transferability through partner collaboration to increase economic rental [83]. HR managers can benchmark against VRIO to measure human capital competencies, employee commitment, culture, and teamwork [84–86]. In the digital era, quick thinking, concentration, and success require excellent execution and top talent. Top-level management or entrepreneurial leadership now prioritizes bold innovation over cost and process

optimization [12, 18, 78]. Expertise in applying a prescriptive mental model for formalization before gathering is essential. The charismatic, ideological, and pragmatic leadership models are combined in the charismatic, ideological, and pragmatic model of leadership [87, 88]. Actions must reflect members' awareness. Organization members learn when their awareness allows the right reflection [89]. They are gathered to improve their understanding of the universe and its phenomena

The authors offer a holistic visualization of homological STEM talent from Table 1. Using a configuration model as a black box, information in an ecosystem interacts and loops back. Figures 1 and 2 exhibit the use of talent value management [17, 62], dynamic capabilities [20, 59], and organization transformation objectives [1, 8, 89, 90] that emerged from the literature review as the three key aspects driving theories for explanation.

Table 1. Literature Foundation of Ecological Environment

Technological evolution as economic ladder	[1, 2, 8, 18, 22, 35, 90, 91]
Digital Transformation and its implications	[3, 37, 38, 65, 90, 92]
Dynamic Capability	[12, 13, 19, 20, 25, 53, 62, 80, 93-96]
Organization structure with configuration theory, process, and variables	[20, 60, 95, 97]
Human Capital	[24, 53, 78, 98]
Psychological Capital and Behavioral Strategy	[44, 62, 99]
Digital Capital	[15, 16]
Talent	[4, 12, 17, 19, 23, 36, 42, 62, 74-76, 79]
Strategic management	[12, 13, 37, 44, 66, 96, 100, 101]
Transdisciplinary	[๖, ๙, ๕๒, ๖๑, ๑๐๒, ๑๐๓]
Business-IT leveraging and architecture	[3, 37, 65, 66, 68, 73, 104, 105]
Mental Model	[11, 12, 44, 87, 88]

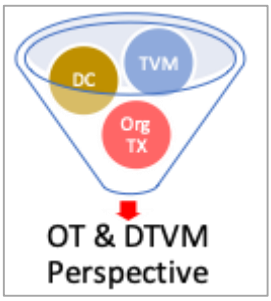

Figure 1. The clustering process of Organizational Digital Transformation, Dynamic Capability and Talent Value Management

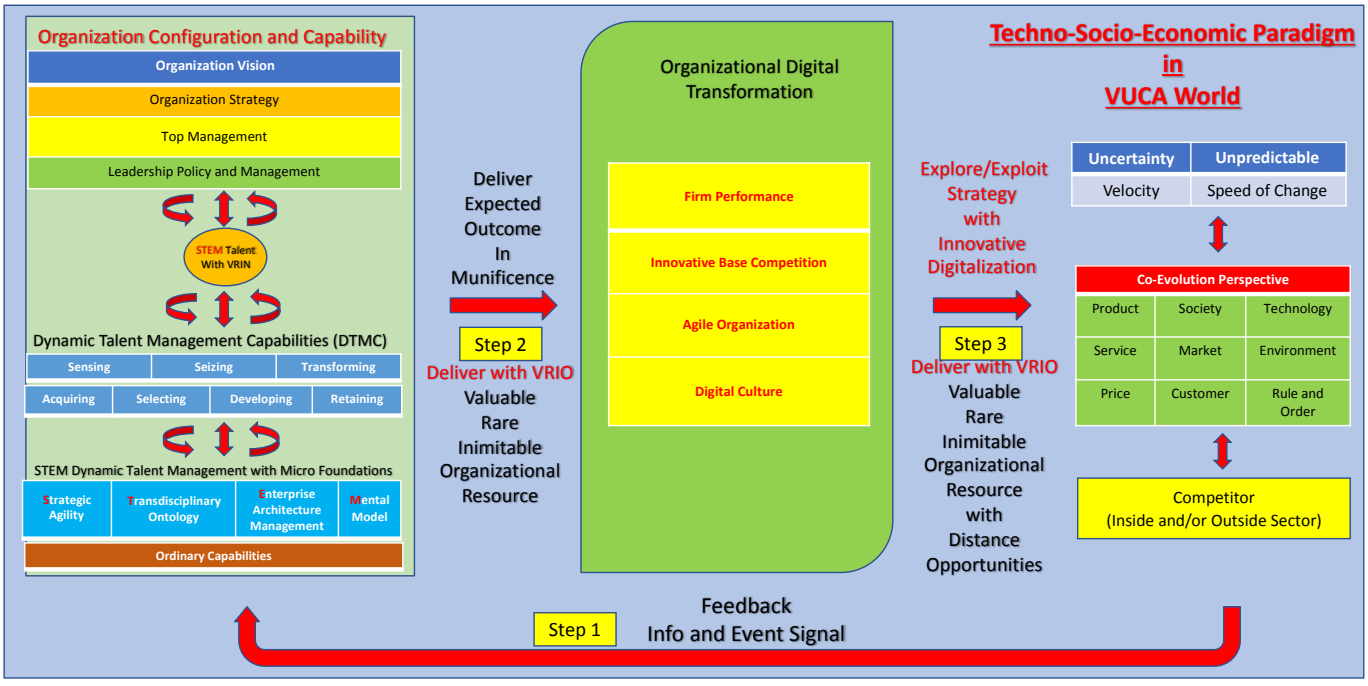

Figure 2. Homological STEM Talent and Configuration in the Context of Ecological Environment

The fast-paced nature of modern business has prompted an uptick in interest in the concept of agility among professionals and academics alike. To maintain their competitive edge, businesses can adapt by capitalizing on their talent and capabilities in line with the RBV. Figure 1 highlights the synergistic effects of clustering talent value management (TVM), dynamic capability (DC), and organization transformation purposes (Org TX). TVM is used to lead and facilitate the rearrangement of internal resources in conjunction with DC perspectives toward the strategic distance of Org TX. The result represents by Organization transformation (OT) as driven by the clustering of TVM and DC domain named dynamic talent value management (DTVM) in response to organization reconfiguration to an external environment in which natural demands for a more agile, adaptive, and competitive stance in the digital era. The environment will force the organization to change or even completely revamp its business models transcending with digitalization to take full advantage of the opportunities presented by their relationships with customers, vendors, partners, technology life cycle, and other members of the business ecosystem.

To succeed in the ever-growing modern market, businesses need to rethink and, in some circumstances, drastically alter their relationships with consumers, suppliers, and other important stakeholder groups to fully exploit the opportunities afforded by these interdependent linkages. Figure 2 displays the relationship between the internal and external ecological contexts of a corporation, as predicted by configuration theory.

- In the first stage of the VUCA world, strategic players under the techno-socio-economic paradigm, such as the market, customers, vendors, and competitors, send out multi-directional signals in the ecological environment, including the targeted organization, to meet their needs. In particular, they had to develop a co-evolutionary attitude for their character, and the signal itself might swing between delivering positive, negative, or neutral feedback. Due to digital disruption, new competitors from different industries could enter the market at any time.
- The second stage involves the company's response to the signal from stage one via its internal structure and resources, all the while bearing in mind the ordinary capability as a linear attribute. The "business as usual" or routine-based strategy is slow to react to the signal in today's digital environment. Dynamic talent value management (DVTM), derived from the previously enigmatic concepts of dynamic capability (DC) and talent value management (TVM), is used by top-level management to activate the vision and implement Organizational Digital Transformation (ODT) as a top-down approach to guarantee agility and adaptability to the external environment. Under VRIO's framework for sustained competitive advantage, the DVTM is intended to develop talent to be the change agent for ODT and the organization by incorporating the proposed factors of the strategic agility, transdisciplinary ontology, enterprise architecture, and mental model (STEM) talent into a program called STEM Talent Management and Micro-Foundations Assistance. Business-IT hybrids will employ the STEM talent in the ODT program to regularly update their strategic distance, business model, operational models, and internal systems.
- In the third stage, as part of the digital transformation program aimed at an innovative-ecological-based competition, improved firm performance, agile organization, and digitalization with a digital adhocracy culture, the company is now able to react to the environment more quickly and gain impact through the explore and exploit strategy. By this time, strategic actors in the environment will have received the organization's evaluation signal and will have sent feedback to the other actors in the environment, perhaps initiating stage one. A configuration theory with loopback describes the perpetual recurrence of stages 1, 2, and 3 once more.
- Stages one, two, and three of the cycle repeat indefinitely with a faster pace in the VUCA world, just like in configuration theory with loopback.

This study mainly focuses on the literature that discusses the significance of talent for digital transformation in organizations (ODT). The selected studies address the effect of digital transformation on organizations. Four critical factors were found in this review that could facilitate the transformation of businesses in Thailand and the Lao P.D.R. into digital enterprises: strategic agility talent, transdisciplinary ontology talent (TOT), enterprise architecture talent, and mental model talent (MMT).

To begin with, the author also conducted a literature review and expert interviews to consider and confirm the important points of each factor (Table 2).

Table 2. Success factors of organizational digital transformation

Proposed factors of organizational digital transformation																
Factor	Item	Component	Researchers													
			[101]	[37]	[90]	[12]	[106]	[42]	[6]	[11]	[13]	[66]	[3]	[19]	Expert interview	Contextual factors
Strategic agile talent (SAT)	1.1	Strategic Improvisation (SI)	●			●						●			●	●
	1.2	Foresight Strategy with Risk Management (FSR)				●	●				●			●	●	●
	1.3	Digital Strategy and Road Map (DSR)		●	●	●		●				●	●		●	●
	1.4	Innovative Based Economy Strategy (IBES)		●	●	●	●	●	●	●			●	●	●	●
Transdisciplinary ontology talent (TOT)	2.1	Learning Agility with Reconcile Adaptability (LRA)			●		●	●	●		●		●	●	●	●
	2.2	Open Innovation and Munificence (OIM)			●		●	●							●	●
	2.3	Digital Literacy with Knowledge Management (DKM)			●	●		●	●			●			●	●
	2.4	Ontology of Realities and Inseparable thematic (ORI)			●			●	●		●				●	●
Enterprise architecture talent (EAT)	3.1	Business-IT Ecological Amalgam (BITEA)		●	●		●	●				●	●		●	●
	3.2	Modular Architecture with Insight Governance (MDIG)		●			●								●	●
	3.3	Business Process Model Notation (BPMN)		●			●								●	●
	3.4	Asset Orchestration (ASSO)					●					●	●		●	●
Mental model talent (MMT)	4.1	Exponential Unbound Cognitive (EUC)						●		●				●	●	●
	4.2	Entrepreneur Mind-set (EM)						●			●			●	●	●
	4.3	Social Networking (SNW)			●		●				●			●	●	●
	4.4	Creativity and Idea Management (CIM)	●		●	●		●			●			●	●	●

Note: Selection was influenced by the most frequent factors, while similar statements were considered important.

2-4- Strategic Agile Talent (SAT)

An ambitious objective for an exponential development strategy is incompatible with an exponential mindset or the capacity to handle limitless constraints [11]. New paradigms of adaptable leadership are necessary for evolving company models with a fluid use of resources, especially for learners. Understanding and modifying business models requires a specific learning perspective [12, 106]. Agile strategic talent has a substantial impact on digital transformation within organizations [47, 107, 108].

2-4-1- Strategic Improvisation (SI)

Creativity is the activity of applying original, inventive problem-solving to produce high-quality, elegant solutions to difficult, ill-defined situations. However, in such a context, spontaneity, a lack of planning, and unexpected events was crucial. IT improvisation capabilities depend on the power to adapt to a highly chaotic environment or storm [66].

2-4-2- Foresight Strategy with Risk Management (FSR)

Strategic foresight requires preparation for counterfactuals and reproducing prior experience to learn from the past and the future. It is also related to scenario planning, which reduces prejudice and enhances people's perception, adaptability, and capacity for change [13], among other advantages. Market risk related to making up for shortfalls in capacity is probably nonlinear [19], but risk management reduces deep uncertainty by finding and fixing unknowns within a set time frame and budget.

2-4-3- Digital Strategy and Road Map (DSR)

A "digital strategy" is defined as a business strategy inspired by digital capabilities and widely accessible technologies, such as Social, Mobile, Analytic, Cloud, and Internet of Things, SMACIT, and future digital plans, by focusing on the delivery of unique, well-structured, and integrated business capabilities through a digitized solution with anticipation capabilities rather than merely satisfying customer needs [45].

2-4-4- Innovative-Based Economy (IBES)

The economic realities associated with innovation include technological evaporation, financial volatility, and disruptive technology [19]. Dynamic capacities make it possible for wealth to originate from invention and creativity, which serve as the impetus for modern economic growth in contexts with greater added value [56, 93].

2-5- Transdisciplinary Ontology Talent (TOT)

People would grow personally and develop professions in co-evolution by transdisciplinary enterprise, also known as transdisciplinary knowledge creation and demystification, to deal with real-world complex challenges, as opposed to their disciplinary potential, hence the significance of the subject [6, 7]. This is while transdisciplinary growth grew rapidly in business, particularly with Bloom's Taxonomy [109]. Transdisciplinary education is a novel approach [55] to operational education [110], which focuses on combining interdisciplinary [111] and multi-disciplinary knowledge to assist businesses in adapting to transient conditions and addressing complex problems [112] through the incorporation of academic knowledge into professional experience, local understanding, and wisdom [113]."Sustainability" is a novel approach [55] to operational education that focuses on combining interdisciplinary and multi-disciplinary knowledge to assist businesses in adapting to changing concerns [114].

2-5-1- Learning Agility with Reconcile Adaptability (LRA)

The establishment of a non-equifinal VRIO attribute-based competitive advantage as opposed to a shifting unique route necessitates learning agile and change-focused organizational cultures. Reconciliation prospects with heterogeneous and immobile VRIO resources are essential for anything resembling a real-world strategic radar, including strategic foresight for a pluralistic perspective of the future [13, 19, 25, 81, 82, 84, 115].

2-5-2- Open Innovation and Munificence (OIM)

Enterprise ecological adaptation was offered as a method for enhancing organizational adaptability and resiliency, i.e., pervasive digital technologies need a new management strategy based on system convergence in deep technology from external and internal sources of expertise [46]. The degree to which an environment can promote growth was termed "maturity," based on which encouraging transdisciplinary entrepreneurship is socially advantageous [6, 102, 97, 116].

2-5-3- Digital Literacy with Knowledge Management (DKM)

Adopting digital learning, accelerated frameworks like agile, and collaborative activities that foster failure are integral elements in the digital sustainability of organizations [41, 78]. In contrast to activities that build knowledge or practical epistemologies, people tend to explain things based on a single factor and how they make them feel [103].

2-5-4- Ontology of Realities and Inseparable thematic (ORI)

Multiple realities are interposed by a concealed third. There are several layers of objective and subjective reality in nature and our understanding of nature, with the actual being permanently concealed but available to our knowledge and concerning dynamic environmental conditions to develop into a new and more complicated self. [6, 7, 102].

2-6- Enterprise Architecture Talent (EAT)

Enterprise architecture talent (EAT) was an important factor in determining the digital organization transformation [3, 117, 118]. The enterprise architecture (EA) focuses on the present and future capabilities, governance, operations, application systems, data, and IT technology, whereas the Enterprise Architecture Model (EAM) emphasizes the alignment of IT management and investment with business strategy and transformation goals [67]. EA links business with technology in the current techno-socio-economic paradigm. EA and IT architectures support transformation. Structure, administration, and facilitation all contribute to the adaptive cycle of this system. [3, 68, 105].

2-6-1- Business-IT Ecological Amalgam (BITEA)

Fit for highly complex environments, it facilitates organizational learning by reshaping enabling businesses into flexible enterprise sector modularity and their environments as bidirectional and purposeful in their evolution, all to the benefit of the organization's capacity for innovation and sustenance [3, 53, 80]

2-6-2- Modular Architecture with Insight Governance (MDIG)

Agile organizations with sense and reaction coordinate and deploy modular technologies and resources on demand, based on customer pull rather than production/marketing drive, to ensure a unified framework, visibility of the underlying governance, and facilitation. The need for businesses to change all the time is called the "adaptive enterprise imperative" [3, 104, 105].

2-6-3- Business Process Model Notation (BPMN)

The value of ethnography in the big data world is highlighted in two ways: first, as a digital space with inherent generative properties for business model renewal to address new emergent opportunities, and second, as a framework for BPM gains from profound structural change as part of a more comprehensive organizational transformation [73].

2-6-4- Asset Orchestration (ASSO)

Asset orchestration is a method of information sharing those entails regulating the flow of information via an organization's architecture and IT leveraging capabilities following the business model of internal and external stakeholders. It is also known as inward open innovation, corporate wide-open innovation, and outward open innovation [19, 46, 119].

2-7- Mental Model Talent (MMT)

The mental model of a social system serves as the primary foundation for mental models or prescriptive perspectives. Individuals form and behave in response to specific events in the social system through time by using the representation of an abstract schematic knowledge structure with an imagined recasting articulation of the future to come [88]. A company's ability to get through mental barriers like analogy and feelings while simultaneously building on prior knowledge and expertise is one of the most crucial aspects of its long-term success [44].

2-7-1- Exponential Unbound Cognitive (EUC)

The ability to create exponential value through an exponential mindset was essential in the digital business paradigm, which culminated in something other than better, like 10x, in which an ambitious vision for an exponential growth strategy carries inherent uncertainty about its compatibility with an exponential mindset or its ability to reconcile borderless bounds [11].

2-7-2- Entrepreneur Mind-set (EM)

In the digital era, it's critical to be quick-thinking, dedicated, and profitable by orchestrating execution excellence, which involves combining co-specialized asset and business activities to create value, assure market and future competitiveness, and hire top people. Bold innovation has replaced cutting costs and improving processes as the primary goals of top-level management, often known as entrepreneurial leadership [12, 18, 19, 78].

2-7-3- Social Networking (SNW)

Through business model renewal, which is made possible by unmatched computing power, an infinite amount of virtual space, and seamless networking, alignment of outside-in opinions and extensive networking are important triggers that help align different points of view and play a big role in organizational transformation [12].

2-7-4- Creativity and Idea Management (CIM)

The development of an ambidextrous organization for exploration and exploitation will reenergize itself periodically and inspire creative surges that will be incorporated into corporate culture [97]. A noteworthy aspect of the corporate culture is the crucial factors that executives and staff [70, 107]. Although the external concept of business and technical collaborations, where the greatest minds are located, is particularly important for changing capabilities and overcoming self-invention syndromes, it may also have a negative impact on culture [13, 46].

3- Research Methodology

3-1- Participants

Participants were selected using a multistage sampling method. The statistical population consisted of 410 individuals who signed informed consent forms. A different level of age, position, and work experience were randomly sampled from a name list of employees of a Thai-based telecom company at 37.6% (n = 154) and a Laos-based telecom company at 62.4% (n = 256). Table 3 specifies the demographics of the participants. The multistage sampling method was selected because of the hierarchical structure of business units. A different level was randomly sampled from a name list of companies based on the departments of specific business units. Hair et al. [120] suggested the use of CFA to determine sample size. The heuristic requires ten times the construct with the number of structural paths. This method indicated 10*16 = 160 as an adequate sample size. Here, the first heuristic was considered using CFA. The usable sample size of 410 exceeded the suggested sample size of 160. Thus, it was determined to be adequate by the power calculations.

3-2- Procedure

Mixed-methods research combining qualitative and quantitative approaches was selected [121]. Qualitative interviews from experts were used to validate each factor's key points from the literature review, and a quantitative survey to obtain in-depth perspectives from respondents was combined to examine the success factors relating to organizational digital transformation in Thailand and Lao P.D.R. A literature review was conducted to explore the success factors relating to organizational digital transformation by selecting systematic reviews. Next, the success

elements were verified and confirmed through expert interviews with specialists. We contacted a total of 10 interviewees for open-ended, audio-recorded interviews. The perceived relevance of the success elements was then assessed using a survey questionnaire that was designed to contain 16 items. A five-point Likert scale was used to rank the questionnaire items, with 1 being the least important and 5 being the most significant. The factors related to SAT, TOT, EAT, and MMT were all given equal weight in the ratings. It was determined how the contextual components were structured using confirmatory factor analysis using LISREL (CFA model). Finally, a set of guidelines was created and put forward to support corporate digital transformation. The flowchart of the research methodology that explains a step-by-step process is presented in Figure 3.

Table 3. Demographic profile of participants

Demographic profile	Particular	Frequency (n)	Percentage (%)
Region	Thai-based telecom company	154	37.6
	Laos-based telecom company	256	62.4
Age	Less than 25 years	2	0.5
	From 25 to 35 years	158	38.5
	From 36 to 45 years	153	37.3
	From 46 to 55 years	81	19.8
	From 56 years and over	16	3.9
Position	AVP and above	20	4.9
	Department manager	61	14.9
	Supervisor	126	30.7
	Officer	152	37.1
	Others	51	12.4
Experience	Less than or equal to 5 years	44	10.7
	From 6 to 10 years	126	30.7
	From 11 to 20 years	150	36.6
	Greater than 20 years	90	22

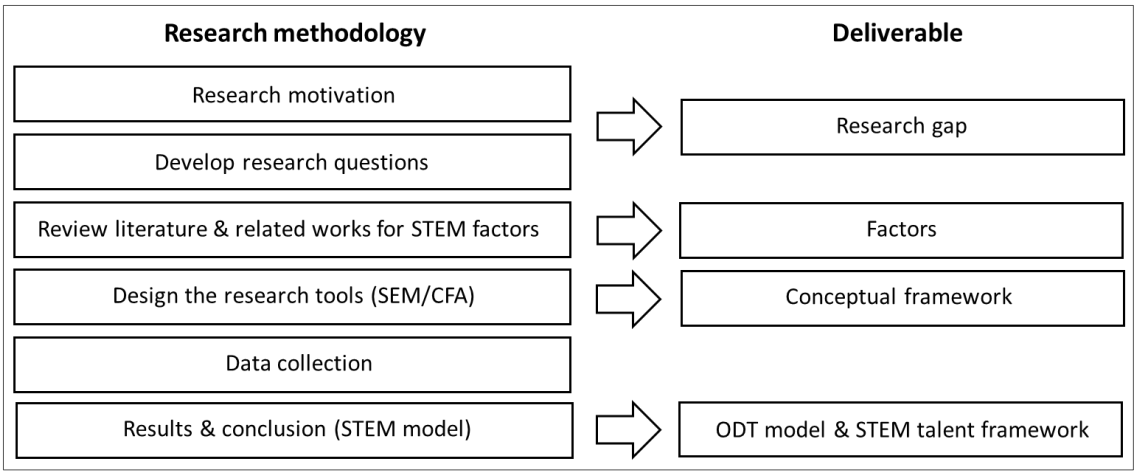

Figure 3. The process of research methodology

4- Results

Confirmatory factor analysis following the maximum-likelihood estimation method was conducted using LISREL (linear structural relations) to confirm the factor structure. Good model fit was assessed using the Chi-square statistic, which compared the tested model and the independent model with the saturated model (c2 /df), comparative fit indices (CFI), the goodness of fit index (GFI), and the adjusted goodness of fit index (AGFI), as well as the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). According to Hair et al. [120] and Jöreskog & Sörbom [116], c^2 /df values are less than 2.00. A good-fitting model has CFI values greater than 0.95, GFI values greater than 0.95, AFGI values greater than 0.90, RMSEA values less than 0.05, and SRMR values less than 0.05. Table 4 presents the fit index results. Acceptable values from the research model demonstrated a satisfactory match to the observed data (c^2 /df = 1.261, CFI = 1.000, GFI = 0.970, AGFI = 0.950, RMSEA = 0.026, SRMR = 0.024).

Table 4. Fit indexes for the model

Fit indexes	Level of acceptable fit	Model	Result
df / χ^2	< 2.00	1.261	Pass
CFI	> 0.95	1.000	Pass
GFI	> 0.95	0.970	Pass
AGFI	> 0.90	0.950	Pass
RMSEA	< 0.05	0.026	Pass
SRMR	< 0.05	0.024	Pass

The CFA results confirm that the four factors containing SAT, TOT, EAT, and MMT were consistent with ODT. Figure 4 presents the four-factor structure of the CFA model. TOT had a factor loading of 1, while SAT had a factor loading of 0.95. TOT was the most effective element in fostering organizational digital transformation, with the factor of mental model talent (MMT) functioning as the runner-up. While SAT showed less capacity to support organizational digital transformation, EAT was the third indication.

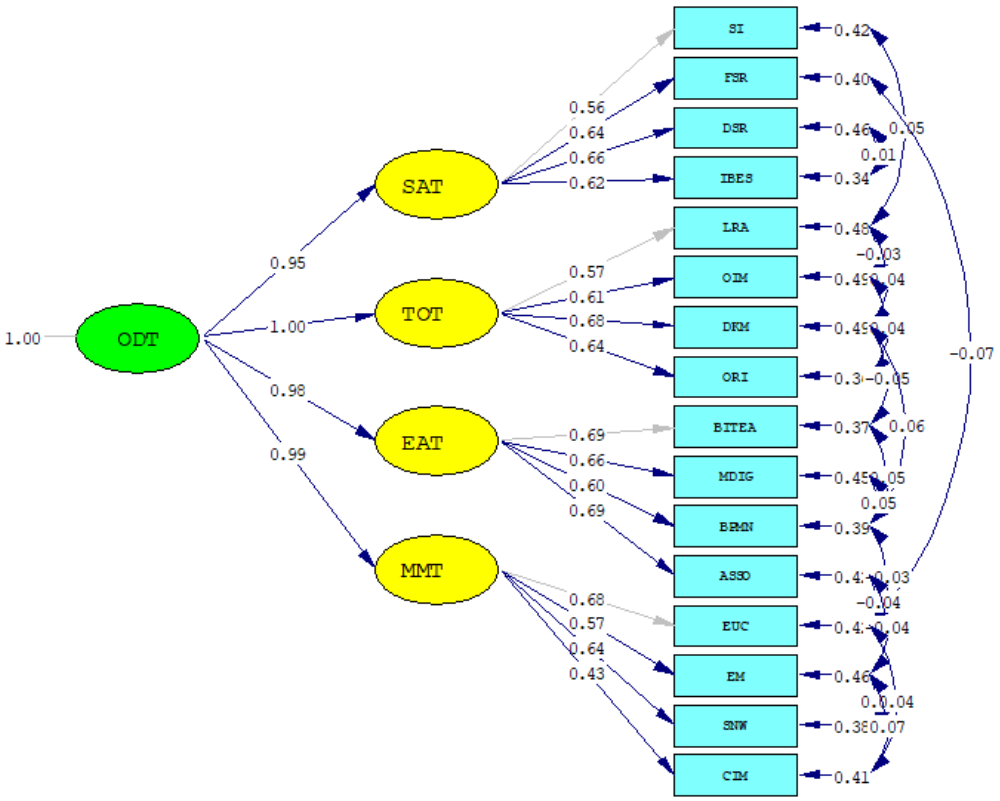

Figure 4. CFA model showing the four factors with organizational digital transformation (Chi-Square =105.95, df = 84, p-value = 0.05308, RMSEA = 0.026)

The CFA result showed that factor loadings at the component level ranged from 0.43 (CIM) to 0.69 (BITEA and ASSO). DSR showed high potential on the SAT test. DKM had the greatest influence (TOT), while BITEA and ASSO had the greatest influence on EAT. The EUC had high effects on mental model talent (MMT) when compared to the others. The findings demonstrated the four-factor model's suitability for explaining the observed survey data. While SAT showed less capacity to support organizational digital transformation, TOT was more important than other characteristics. The findings indicate that Thailand's and Lao's talents have a high degree of TOT, MMT EAT, and SAT. Thus, companies need to respond to these challenges by building STEM talents to act as the core organizational capability to achieve organizational digital transformation. This is consistent with several researchers who studied the factors of talent management for digital transformation in organizations [3, 6, 11–13, 19, 37, 42, 66, 90, 101, 106].

5- Practical Implication

The findings of this study lay the groundwork for a techno-social-economic paradigm and digitalization in a VUCA world through STEM talent and its artifacts that constructed and validated a comprehensive set of dynamic capabilities and talent value management, also known as dynamic talent value management, for organizational digital transformation.

In the digital age [54, 55, 122], an organization must put agile organization [11, 13, 19, 37, 66, 101, 106], improving firm performance [10, 12, 18-20, 22, 78, 80, 87, 123], innovative base competition [12, 18, 90-92], and digital culture [13, 19, 38, 51] at the top of its list of priorities and make dynamic plans for its resources and capabilities. Leaders and managers must plan ahead while remaining capable of adapting enough to deal with major issues as they arise. Individual or collective talent is critical to the future success of an organization and the development of the next generation of leaders. We propose a STEM talent framework and its artifact as shown in Figure 5 to manage talent that possesses the most modernized capabilities, aiming for success in organizational digital transformation.

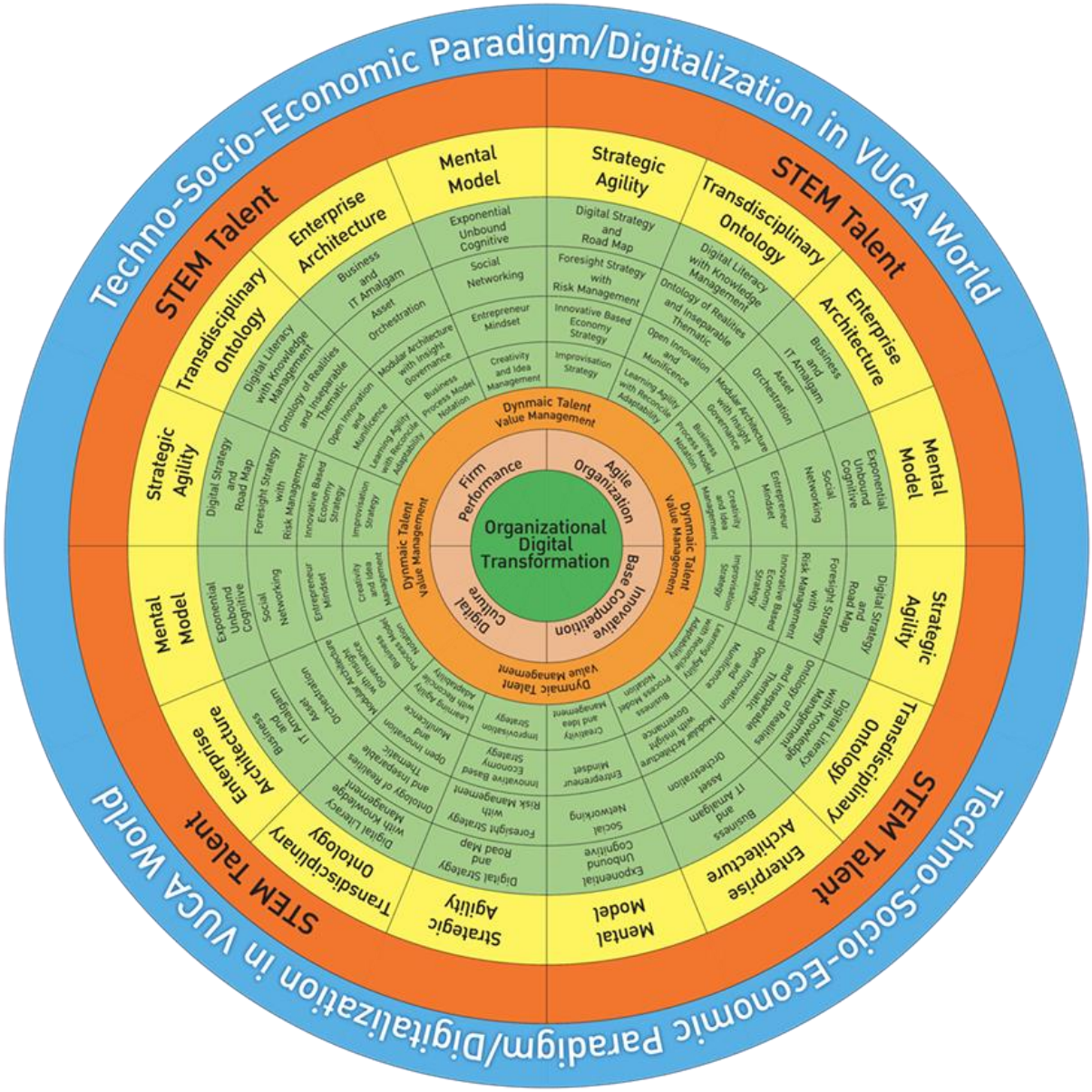

Figure 5. STEM Talent Framework for Organizational Digital Transformation

STEM talent, together with its artifacts, is a vital and potent source of value as a strategic agent, facilitator, and connector to cultivate a competitive advantage both inside and outside of an organization. The findings of this study suggest that transdisciplinary ontology can motivate a hypothetical approach to customer problems as co-evolution, while strategic agility and a mental model can aid in bringing this approach to fruition through adaptation with grit. Enterprise architecture helps organizations reap the benefits of a business-IT amalgamation, especially in real-time situations and prediction, by providing value through data, insight, and governance to bridge the gap between the organization's current and future architectures for its digital transformation roadmap.

This research may assist to explain why organizations continue to experience organizational and externally imposed hurdles when striving to realize the anticipated economic benefits and scale through organizational digital transformation. The STEM talent framework and its artifacts can highlight the need for modernized talent management, paradigms, and capabilities to their full potential as reliable, valid, and trustworthy with a grounding in theory for success in organizational digital transformation.

As stated previously, we performed a literature review in Table 1 and proposed success factors in Table 2. The said success factors were validated by expert interviews in line with talent management related to organizational digital transformation [17, 62, 74] and then confirmed by the CFA method. Finally, we can summarize the STEM talent framework for organizational digital transformation as a co-evolution of external-to-internal composition and vice versa. Organizations are affected by the external environment, beginning with the techno-socio-economic paradigm and digitalization in a VUCA world. Organizational leaders must manage internal organizational changes to transform the business for the new environment. STEM talent can be applied as a strategic change agent to the management transformation process. It comprises strategic agility, a transdisciplinary ontology, enterprise architecture, and a mental model. Each item illustrates the essential components shown in green space. This revolving wheel is propelled by STEM talent and governed by dynamic talent value management with the purpose of organizational digital transformation. In light of this, the results presented the organization's goals of (1) firm performance, (2) agile organization, (3) innovative base competition, and (4) digital culture in the brown space. Eventually, there will be a green center point that reflects the framework's goal of sustainable digital transformation for organizations.

6- Discussion

The findings of this research can be adopted and applied to digitally transform organizations in Thailand and the Lao P.D.R. The study confirmed that all aspects of the proposed factors are important and consistent with prior studies (Tables 1 and 2). The results of talent success factors according to quantitative and qualitative data indicated that the most important factor for ODT is TOT. This finding corresponds to aiding firms in demonstrating their capability to adapt to new circumstances and solve complex issues [6, 7, 52, 90, 92, 112]. Transdisciplinary is essential with the evolution of inter-disciplinary and multidisciplinary approaches to operating a firm in a VUCA environment with a unique strategy [4, 55, 111–114]. COVID-19 is a global pandemic that has compelled organizations in nearly every nation to undergo digital transformation because of the lockdown [72, 89, 118]. In this regard, to determine how the company has responded to the pandemic to ensure that business continues, the findings confirm that the factors of EAT [3, 49, 67–69, 105] linked between business and technology are success factors to enable digital transformation effectively. Finally, SAT [11, 12, 47, 106–108] and MMT [11, 12, 44, 87, 88] influence behavioral intention to proceed under limitation and fluid resources. Digital transformation requires strategic flexibility and a digital mindset to deal with both decision-making risks and uncertainties. It also requires the agile implementation of new concepts. As such, the willingness of individuals to join and take part is necessary for the next step. With these, the empirical data obtained in this study bolsters the common, global success factors that support digital transformation in organizations.

7- Conclusion

This study was to identify influential factors in the ODT and confirm its structural dimensions. The CFA results confirmed that the model presented a good fit to the observed data in four dimensions, including SAT, TOT, EAT, and MMT. These four dimensions were also found to be integral to cultural change in organizations and digital transformation strategies. ODT is a cultural change that necessitates organizations to constantly challenge themselves through progressive experiments and innovative approaches to problem-solving. Slow technological adoption in economic practice and governance is costly for countries and organizations in sectors where digital transformation would promote economic development, particularly human capital with new paradigms and core competencies while being predictable and auditable. Furthermore, in the pursuit of competitive advantage, the relationship between dynamic capabilities and talent value management can be altered and transformed by organizational and external components when discovering and leveraging IT-leveraged capabilities, which is congruent with digitalization. According to our research, TOT has the most significant impact, followed by MMT, EAT, and SAT. To demonstrate this connection, we proposed a framework in corporate with a vibrant atmosphere, organizational goals, and STEM talent underlying dynamic talent value management capability. We found that organizational digital transformation aspects are substantial and consistent with other studies. They may be implemented beyond Thailand and Lao P.D.R. contexts. Future research can address the degree to which an organization is prepared for the digital revolution and its maturity in talent management, where the singularity may be near.

8- Declarations

8-1- Author Contributions

Conceptualization, P.J.; methodology, P.J.; software, P.J.; validation, S.K. and S.D.; formal analysis, P.J.; investigation, P.J.; resources, P.J.; data curation, P.J.; writing—original draft preparation, P.J.; writing—review and editing, P.J., S.K., and S.D.; visualization, P.J.; supervision, S.K. and S.D. All authors have read and agreed to the published version of the manuscript.

8-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

8-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

8-4- Institutional Review Board Statement

Not applicable.

8-5- Informed Consent Statement

Not applicable.

8-6- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

9- References

[1] Rosenberg, N., & Frischtak, C. R. (1984). Technological innovation and long waves. Cambridge Journal of Economics, 8(1), 7–24. doi:10.1017/cbo9780511582554.006.

[2] Rosenberg, N. (1974). Karl Marx on the Economic Role of Science. Journal of Political Economy, 82(4), 713–728. doi:10.1086/260230.

[3] Korhonen, J. J., & Halen, M. (2017). Enterprise Architecture for Digital Transformation. 2017 IEEE 19th Conference on Business Informatics (CBI), Thessaloniki, Greece. doi:10.1109/cbi.2017.45.

[4] Karacay, G. (2018). Talent Development for Industry 4.0. In: Industry 4.0: Managing the Digital Transformation. Springer Series in Advanced Manufacturing. Springer, Cham, Switzerland. doi:10.1007/978-3-319-57870-5_7.

[5] Park, Y., El Sawy, O. A., & Fiss, P. C. (2017). The role of business intelligence and communication technologies in organizational agility: A configurational approach. Journal of the Association for Information Systems, 18(9), 648–686. doi:10.17705/1jais.00001.

[6] McGregor, S. (2015). Transdisciplinary Knowledge Creation. Transdisciplinary Professional Learning and Practice. Springer, Cham, Switzerland. doi:10.1007/978-3-319-11590-0_2.

[7] Nicolescu, B. (2014). Methodology of transdisciplinarity. World Futures, 70(3–4), 186–199. doi:10.1080/02604027.2014.934631.

[8] Li, G., Hou, Y., & Wu, A. (2017). Fourth Industrial Revolution: technological drivers, impacts and coping methods. Chinese Geographical Science, 27(4), 626–637. doi:10.1007/s11769-017-0890-x.

[9] IMD World Competitiveness Center. (2020). IMD World Digital Competitiveness Ranking 2020. International Institute for Management Development, Lausanne, Switzerland.

[10] Anderson, P., & Tushman, M. L. (1990). Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change. Administrative Science Quarterly, 35(4), 604. doi:10.2307/2393511.

[11] Bonchek, M. (2016). How to Create an Exponential Mindset. Harvard Business Review. Available online: https://hbr.org/2016/07/how-to-create-an-exponential-mindset (accessed on April 2023).

[12] Schoemaker, P. J. H., Heaton, S., & Teece, D. (2018). Innovation, Dynamic Capabilities, and Leadership. California Management Review, 61(1), 15–42. doi:10.1177/0008125618790246.

[13] Scoblic, J. P. (2020). Strategic foresight as dynamic capability: A new lens on Knightian uncertainty. Working Paper, Harvard Business School, Boston, United States.

[14] Neote, G., Crawford, S., Suen, L., Lambourn, E., Sammons, D., Gaastra, A., Mason, A., Hallahan, R., Scafe-Smith, S., & Shava, M. (2019). Digital Capital Projects: The capital project of the future. Deloitte, New York, United States.

[15] Adarov, A., & Stehrer, R. (2020). New productivity drivers: Revisiting the role of digital capital, FDI and integration at aggregate and sectoral levels. Working Paper, the Vienna Institute for International Economic Studies, Vienna, Austria.

[16] Bughin, J., & Manyika, J. (2018). Measuring the full impact of digital capital. McKinsey & Company, New York, United States.

[17] Sparrow, P. R., & Makram, H. (2015). What is the value of talent management? Building value-driven processes within a talent management architecture. Human Resource Management Review, 25(3), 249–263. doi:10.1016/j.hrmr.2015.04.002.

[18] Christensen, C. M. (2013). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press, Massachusetts, United States.

[19] Teece, D. J. (2019). A capability theory of the firm: an economics and (Strategic) management perspective. New Zealand Economic Papers, 53(1), 1–43. doi:10.1080/00779954.2017.1371208.

[20] Wilden, R., Devinney, T. M., & Dowling, G. R. (2016). The Architecture of Dynamic Capability Research Identifying the Building Blocks of a Configurational Approach. Academy of Management Annals, 10(1), 997–1076. doi:10.1080/19416520.2016.1161966.

[21] Bowman, C., & Ambrosini, V. (2000). Value Creation versus Value Capture: Towards a Coherent Definition of Value in Strategy. British Journal of Management, 11(1), 1–15. doi:10.1111/1467-8551.00147.

[22] Penrose, E. T., & Pitelis, C. (2002). The growth of the firm: the legacy of Edith Penrose. Oxford University Press on Demand, New York, United States.

[23] Human Capital Institute. (2008). The State of Talent Management: Today's Challenges, Tommorrow's Opportunity'. Human Capital Institute, New York, United States.

[24] Lepak, D. P., & Snell, S. A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. Academy of Management Review, 24(1), 31–48. doi:10.5465/AMR.1999.1580439.

[25] Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they?. Strategic management journal, 21(10‐11), 1105-1121. doi:10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E.

[26] Widjajanti, K. (2009). Transformasi Organisasional Privatisasi BUMN di Indonesia. Jurnal Ekonomi Dan Bisnis, 10(2), 322. doi:10.30659/ekobis.10.2.322-333.

[27] Mubarak, M. F., Shaikh, F. A., Mubarik, M., Samo, K. A., & Mastoi, S. (2019). The Impact of Digital Transformation on Business Performance: A Study of Pakistani SMEs. Engineering, Technology & Applied Science Research, 9(6), 5056–5061. doi:10.48084/etasr.3201.

[28] Buul, O. B., & Omundi, D. R. (2017). An Analysis of Competitive Strategies and Performance of Small and Medium Enterprises in Kenya: a Case of Nairobi Central Business District. Journal of Business and Strategic Management, 2(2), 72–94. doi:10.47941/jbsm.127.

[29] Isaboke, S. N. (2018). Competitive strategies and performance of micro and small enterprises in Nairobi County, Kenya. Master Thesis, Kenyatta University, Kahawa, Nairobi.

[30] Nasiri, M., Saunila, M., & Ukko, J. (2022). Digital orientation, digital maturity, and digital intensity: determinants of financial success in digital transformation settings. International Journal of Operations and Production Management, 42(13), 274–298. doi:10.1108/IJOPM-09-2021-0616.

[31] Winasis, S., Wildan, U., & Sutawidjaya, A. H. (2020). Impact of digital transformation on employee engagement influenced by work stress on Indonesian private banking sector. Proceedings of the 5th NA International Conference on Industrial Engineering and Operations Management, 10-14 August, 2020, Detroit, United States.

[32] Alavi, S., & Habel, J. (2021). The human side of digital transformation in sales: review & future paths. Journal of Personal Selling and Sales Management, 41(2), 83–86. doi:10.1080/08853134.2021.1920969.

[33] Thuy, N.V. (2021). Strategy, Culture, Human Resource, IT Capability, Digital Transformation and Firm Performance–Evidence from Vietnamese Enterprises. Behavioral Predictive Modeling in Economics. Studies in Computational Intelligence, 897. Springer, Cham, Switzerland. doi:10.1007/978-3-030-49728-6_16.

[34] Teece, D. J. (2018). Business models and dynamic capabilities. Long Range Planning, 51(1), 40–49. doi:10.1016/j.lrp.2017.06.007.

[35] Cantwell, J., & Santangelo, G. D. (2000). Capitalism, profits and innovation in the new techno-economic paradigm. Journal of Evolutionary Economics, 10(1–2), 131–157. doi:10.1007/s001910050009.

[36] Whysall, Z., Owtram, M., & Brittain, S. (2019). The new talent management challenges of Industry 4.0. Journal of Management Development, 38(2), 118–129. doi:10.1108/JMD-06-2018-0181.

[37] Park, Y., Sawy, O. A. El, & Hong, T. (2020). Digital Transformation to Real-Time Enterprise to Sustain Competitive Advantage in the Digitized World: The Role of Business Intelligence and Communication Systems. Korea Business Review, 24(0), 105–130. doi:10.17287/kbr.2020.24.0.105.

[38] Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326–349. doi:10.1016/j.lrp.2018.12.001.

[39] Davenport, T. H., & Westerman, G. (2018). Why so many high-profile digital transformations fail. Harvard Business Review, 9(4), 15.

[40] Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. Journal of Strategic Information Systems, 21(2), 103–124. doi:10.1016/j.jsis.2012.05.001.

[41] Strack, R., Dyrchs, S., Kotsis, A., & Mingardon, S. (2017). How to Gain and Develop Digital Talent and Skills. The New Way of Working Series, Boston Consulting Group (BCG), Boston, United States. Available online: https://www.bcg.com/publications /2017/people-organization-technology-how-gain-develop-digital-talent-skills (accessed on April 2023).

[42] The Business School for the World (INSEAD). (2020). Global Talent in the age of Artificial Intelligence, the Global Talent Competitive Index 2020. The Business School for the World (INSEAD), Fontainebleau, France.

[43] Dries, N. (2013). The psychology of talent management: A review and research agenda. Human Resource Management Review, 23(4), 272–285. doi:10.1016/j.hrmr.2013.05.001.

[44] Gavetti, G. (2012). Perspective toward a behavioral theory of strategy. Organization Science, 23(1), 267–285. doi:10.1287/orsc.1110.0644.

[45] Sebastian, I. M., Moloney, K. G., Ross, J. W., Fonstad, N. O., Beath, C., & Mocker, M. (2017). How big old companies navigate digital transformation. MIS Quarterly Executive, 16(3), 197–213. doi:10.4324/9780429286797-6.

[46] Bogers, M., Chesbrough, H., Heaton, S., & Teece, D. J. (2019). Strategic Management of Open Innovation: A Dynamic Capabilities Perspective. California Management Review, 62(1), 77–94. doi:10.1177/0008125619885150.

[47] AlNuaimi, B. K., Kumar Singh, S., Ren, S., Budhwar, P., & Vorobyev, D. (2022). Mastering digital transformation: The nexus between leadership, agility, and digital strategy. Journal of Business Research, 145, 636–648. doi:10.1016/j.jbusres.2022.03.038.

[48] Snabe Hagemann, J., & Weinelt, B. (2016). Digital transformation of industries: Demystifying digital and securing $100 trillion for society and industry by 2025. World Economic Forum, Cologny, Switzerland.

[49] Winter, R., Legner, C., & Fischbach, K. (2014). Introduction to the special issue on enterprise architecture management. Information Systems and E-Business Management, 12(1), 1–4. doi:10.1007/s10257-013-0221-4.

[50] Menglong, L., Shuanghui, Y., Mengmeng, Z., Tao, C., Honghui, C., & Xiaoxue, Z. (2020). A coevolutionary framework of business-IT alignment via the lens of enterprise architecture. Journal of Systems Engineering and Electronics, 31(5), 983–995. doi:10.23919/JSEE.2020.000073.

[51] Frankiewicz, B., & Chamorro-Premuzic, T. (2020). Digital transformation is about talent, not technology. Harvard Business Review, 6(3), 1-6.

[52] McGregor, S. L. T., & Gibbs, P. (2020). Being in the Hidden Third: Insights into Transdisciplinary Ontology. Transdisciplinary Journal of Engineering & Science, 11, 11. doi:10.22545/2020/00139.

[53] Kurtmollaiev, S. (2020). Dynamic Capabilities and Where to Find Them. Journal of Management Inquiry, 29(1), 3–16. doi:10.1177/1056492617730126.

[54] Malamousi, K., Delibasis, K., Allcock, B., & Kamnis, S. (2022). Digital transformation of thermal and cold spray processes with emphasis on machine learning. Surface and Coatings Technology, 433, 128138. doi:10.1016/j.surfcoat.2022.128138.

[55] Mardani, A., Saraji, M. K., Mishra, A. R., & Rani, P. (2020). A novel extended approach under hesitant fuzzy sets to design a framework for assessing the key challenges of digital health interventions adoption during the COVID-19 outbreak. Applied Soft Computing Journal, 96, 106613. doi:10.1016/j.asoc.2020.106613.

[56] Sainsbury, D. (2021). Toward a dynamic capability theory of economic growth. Industrial and Corporate Change, 29(4), 1047–1065. doi:10.1093/ICC/DTZ054.

[57] Jin, C., Xu, A., Zhu, Y., & Li, J. (2023). Technology growth in the digital age: Evidence from China. Technological Forecasting and Social Change, 187, 122221. doi:10.1016/j.techfore.2022.122221.

[58] Zott, C. (2003). Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. Strategic Management Journal, 24(2), 97–125. doi:10.1002/smj.288.

[59] Teece, D. J., Pisano, G., & Shuen, A. (2001). Dynamic Capabilities and Strategic Management. The Nature and Dynamics of Organizational Capabilities, 334–362, Oxford University Press, Oxford, United Kingdom. doi:10.1093/0199248540.003.0013.

[60] Mintzberg, H. (1989). The Structuring of Organizations. Readings in Strategic Management. Palgrave, London, United Kingdom. doi:10.1007/978-1-349-20317-8_23.

[61] Fainshmidt, S., Wenger, L., Pezeshkan, A., & Mallon, M. R. (2019). When do Dynamic Capabilities Lead to Competitive Advantage? The Importance of Strategic Fit. Journal of Management Studies, 56(4), 758–787. doi:10.1111/joms.12415.

[62] Harsch, K., & Festing, M. (2020). Dynamic talent management capabilities and organizational agility—A qualitative exploration. Human Resource Management, 59(1), 43–61. doi:10.1002/hrm.21972.

[63] Mas, J. M., & Gómez, A. (2021). Social partners in the digital ecosystem: Will business organizations, trade unions and government organizations survive the digital revolution? Technological Forecasting and Social Change, 162, 120349. doi:10.1016/j.techfore.2020.120349.

[64] Furneaux, & Wade. (2011). An Exploration of Organizational Level Information Systems Discontinuance Intentions. MIS Quarterly, 35(3), 573. doi:10.2307/23042797.

[65] Pavlou, P. A., & El Sawy, O. A. (2006). From IT leveraging competence to competitive advantage in turbulent environments: The case of new product development. Information Systems Research, 17(3), 198–227. doi:10.1287/isre.1060.0094.

[66] Pavlou, P. A., & Sawy, O. A. E. (2010). The "Third Hand": IT-enabled competitive advantage in turbulence through improvisational capabilities. Information Systems Research, 21(3), 443–471. doi:10.1287/isre.1100.0280.

[67] Shanks, G., Gloet, M., Asadi Someh, I., Frampton, K., & Tamm, T. (2018). Achieving benefits with enterprise architecture. Journal of Strategic Information Systems, 27(2), 139–156. doi:10.1016/j.jsis.2018.03.001.

[68] Ross, J. W. (2005). Creating a Strategic IT Architecture Competency: Learning in Stages. SSRN Electronic Journal. doi:10.2139/ssrn.416180.

[69] ElMassah, S., & Mohieldin, M. (2020). Digital transformation and localizing the Sustainable Development Goals (SDGs). Ecological Economics, 169, 106490. doi:10.1016/j.ecolecon.2019.106490.

[70] Anugerah, A. R., Muttaqin, P. S., & Trinarningsih, W. (2022). Social network analysis in business and management research: A bibliometric analysis of the research trend and performance from 2001 to 2020. Heliyon, 8(4), 9270. doi:10.1016/j.heliyon.2022.e09270.

[71] Abraham, O., Rosenberger, C. A., & Birstler, J. (2022). Psychometric validation of the AOSL scale using confirmatory factor analysis: A nationally representative sample. Journal of the American Pharmacists Association, 62(5), 1638-1643.e6. doi:10.1016/j.japh.2022.03.017.

[72] Ali, I., Arslan, A., Chowdhury, M., Khan, Z., & Tarba, S. Y. (2022). Reimagining global food value chains through effective resilience to COVID-19 shocks and similar future events: A dynamic capability perspective. Journal of Business Research, 141, 1–12. doi:10.1016/j.jbusres.2021.12.006.

[73] Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. European Journal of Information Systems, 29(3), 238–259. doi:10.1080/0960085X.2020.1718007.

[74] Makram, H., Sparrow, P., & Greasley, K. (2017). How do strategic actors think about the value of talent management? Moving from talent practice to the practice of talent. Journal of Organizational Effectiveness, 4(4), 259–378. doi:10.1108/JOEPP-06-2017-0051.

[75] Gallardo-Gallardo, E., Thunnissen, M., & Scullion, H. (2019). Talent management: context matters. The International Journal of Human Resource Management, 31(4), 457–473. doi:10.1080/09585192.2019.1642645.

[76] Ulrich, D., & Smallwood, N. (2011). What is talent? Leader to Leader, 2012(63), 55–61. doi:10.1002/ltl.20011.

[77] Aguinis, H., & O'Boyle, E. (2014). Star performers in twenty-first century organizations. Personnel Psychology, 67(2), 313–350. doi:10.1111/peps.12054.

[78] Fitz-Enz, J. (2000). The ROI of human capital: Measuring the economic value of employee performance. AMACOM, New York, United States.

[79] Collings, D. G., & Mellahi, K. (2009). Strategic talent management: A review and research agenda. Human Resource Management Review, 19(4), 304–313. doi:10.1016/j.hrmr.2009.04.001.

[80] Collis, D. J. (1994). Research Note: How Valuable are Organizational Capabilities? Strategic Management Journal, 15(S1), 143–152. doi:10.1002/smj.4250150910.

[81] Barney, J. B. (1995). Looking inside for competitive advantage. Academy of Management Perspectives, 9(4), 49–61. doi:10.5465/ame.1995.9512032192.

[82] Barney, J. B. (2012). Gaining and sustaining a competitive advantage. Introduction to E-Business, Academic Search Engine, 313–335. doi:10.4324/9780080492780-16

[83] Čirjevskis, A. (2022). A Discourse on Foresight and the Valuation of Explicit and Tacit Synergies in Strategic Collaborations. Journal of Risk and Financial Management, 15(7), 305. doi:10.3390/jrfm15070305.

[84] Mahdi, O. R., & Nassar, I. A. (2021). The business model of sustainable competitive advantage through strategic leadership capabilities and knowledge management processes to overcome covid-19 pandemic. Sustainability (Switzerland), 13(17), 9891. doi:10.3390/su13179891.

[85] Barney, J. B., & Wright, P. M. (1998). On becoming a strategic partner: The role of human resources in gaining competitive advantage. Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management, 37(1), 31-46. doi:10.1002/(SICI)1099-050X(199821)37:1<31::AID-HRM4>3.0.CO;2-W.

[86] Höse, K., Süß, A., & Götze, U. (2022). Sustainability-Related Strategic Evaluation of Business Models. Sustainability (Switzerland), 14(12), 7285. doi:10.3390/su14127285.

[87] Griffith, J. A., Gibson, C., Medeiros, K., MacDougall, A., Hardy, J., & Mumford, M. D. (2018). Are You Thinking What I'm Thinking?: The Influence of Leader Style, Distance, and Leader–Follower Mental Model Congruence on Creative Performance. Journal of Leadership and Organizational Studies, 25(2), 153–170. doi:10.1177/1548051817750537.

[88] Mumford, M. D., Hunter, S. T., Friedrich, T. L., & Caughron, J. J. (2009). Charismatic, ideological, and pragmatic leadership: An examination of multi-level influences on emergence and performance. Research in Multi-Level Issues, 8, 79–116. doi:10.1108/S1475-9144(2009)0000008004.

[89] Cloos, J., & Mohr, S. (2022). Acceptance of data sharing in smartphone apps from key industries of the digital transformation: A representative population survey for Germany. Technological Forecasting and Social Change, 176, 121459. doi:10.1016/j.techfore.2021.121459.

[90] Nambisan, S., Lyytinen, K., & Yoo, Y. (2020). Digital innovation: towards a transdisciplinary perspective. Handbook of Digital Innovation, 2–12, Edward Elgar, Cheltenham, United Kingdom. doi:10.4337/9781788119986.00008.

[91] K., M.G., & Schumpeter, J. A. (1941). Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process. Journal of the Royal Statistical Society, 104(2), 177. doi:10.2307/2980037.

[92] Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. Research Policy, 48(8), 1–9. doi:10.1016/j.respol.2019.03.018.

[93] Uçan, O., Budak, H., & Aktekin, E. D. (2022). Analysis of relationship between economic growth and energy consumption in developed countries. Journal of Human, Earth, and Future, 3(1), 82-89. doi:10.28991/HEF-2022-03-01-06.

[94] Dosi, G., Nelson, R. R., & Winter, S. G. (2001). The Nature and Dynamics of Organizational Capabilities. Oxford University Press, Oxford, United Kingdom. doi:10.1093/0199248540.001.0001.

[95] Nelson, R. R., & Winter, S. G. (2002). Evolutionary theorizing in economics. Journal of Economic Perspectives, 16(2), 23–46. doi:10.1257/0895330027247.

[96] Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. California Management Review, 58(4), 13–35. doi:10.1525/cmr.2016.58.4.13.

[97] Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. California Management Review, 38(4), 8–29. doi:10.2307/41165852.

[98] Boon, C., Eckardt, R., Lepak, D. P., & Boselie, P. (2018). Integrating strategic human capital and strategic human resource management. International Journal of Human Resource Management, 29(1), 34–67. doi:10.1080/09585192.2017.1380063.

[99] Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. Administrative Science Quarterly, 45(1), 113–137. doi:10.2307/2666981.

[100] Robeyns, I. (2006). The Capability Approach in Practice. Journal of Political Philosophy, 14(3), 351–376. doi:10.1111/j.1467-9760.2006.00263.x.

[101] Vera, D., & Crossan, M. (2004). Theatrical Improvisation: Lessons for Organizations. Organization Studies, 25(5), 727–749. doi:10.1177/0170840604042412.

[102] McGregor, S. L. T. (2011). Place and Transdisciplinarity. Transdisciplinary Journal of Engineering & Science, 2. doi:10.22545/2011/00020.

[103] Kuhn, D. (2020). Why Is Reconciling Divergent Views a Challenge? Current Directions in Psychological Science, 29(1), 27–32. doi:10.1177/0963721419885996.

[104] Lapalme, J. (2012). Three schools of thought on enterprise architecture. IT Professional, 14(6), 37–43. doi:10.1109/MITP.2011.109.

[105] Korhonen, J. J., Lapalme, J., McDavid, D., & Gill, A. Q. (2016). Adaptive Enterprise Architecture for the Future: Towards a Reconceptualization of EA. 2016 IEEE 18th Conference on Business Informatics (CBI). doi:10.1109/cbi.2016.38.

[106] Doz, Y. L., & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. Long Range Planning, 43(2–3), 370–382. doi:10.1016/j.lrp.2009.07.006.

[107] Ahn, M. J., & Chen, Y. C. (2022). Digital transformation toward AI-augmented public administration: The perception of government employees and the willingness to use AI in government. Government Information Quarterly, 39(2), 101664. doi:10.1016/j.giq.2021.101664.

[108] Alalwan, A. A., Baabdullah, A. M., Dwivedi, Y. K., Rana, N. P., Lal, B., & Raman, R. (2021). Et-moone and marketing relationship governance: The effect of digital transformation and ICT during the COVID-19 pandemic. Industrial Marketing Management, 98, 241–254. doi:10.1016/j.indmarman.2021.09.001.

[109] Sharunova, A., Wang, Y., Kowalski, M., & Qureshi, A. J. (2022). Applying Bloom's taxonomy in transdisciplinary engineering design education. International Journal of Technology and Design Education, 32(2), 987–999. doi:10.1007/s10798-020-09621-x.

[110] Bianchi, R. (2020). Do burnout and depressive symptoms form a single syndrome? Confirmatory factor analysis and exploratory structural equation modeling bifactor analysis. Journal of Psychosomatic Research, 131, 109954. doi:10.1016/j.jpsychores.2020.109954.

[111] Peres, F. F., Eufrásio, R. Á., Gouvêa, D. A., Diana, M. C., Santos, C. M., Swardfager, W., Abílio, V. C., & Cogo-Moreira, H. (2018). A schizophrenia-like behavioral trait in the SHR model: Applying confirmatory factor analysis as a new statistical tool. Progress in Neuro-Psychopharmacology and Biological Psychiatry, 85, 16–22. doi:10.1016/j.pnpbp.2018.03.021.

[112] Mouter, N., Collewet, M., de Wit, G. A., Rotteveel, A., Lambooij, M. S., & Kessels, R. (2021). Societal Effects Are a Major Factor for the Uptake of the Coronavirus Disease 2019 (COVID-19) Digital Contact Tracing App in The Netherlands. Value in Health, 24(5), 658–667. doi:10.1016/j.jval.2021.01.001.

[113] Hock-Doepgen, M., Clauss, T., Kraus, S., & Cheng, C. F. (2021). Knowledge management capabilities and organizational risk-taking for business model innovation in SMEs. Journal of Business Research, 130, 683–697. doi:10.1016/j.jbusres.2019.12.001.

[114] Li, S., Ding, J., Zheng, X., & Sui, Y. (2021). Beach tourists behavior and beach management strategy under the ongoing prevention and control of the COVID-19 pandemic: A case study of Qingdao, China. Ocean & Coastal Management, 215, 105974. doi:10.1016/j.ocecoaman.2021.105974.

[115] Vera, D., Nemanich, L., Vélez-Castrillón, S., & Werner, S. (2016). Knowledge-Based and Contextual Factors Associated with R&D Teams' Improvisation Capability. Journal of Management, 42(7), 1874–1903. doi:10.1177/0149206314530168.

[116] Jöreskog, K. G., & Sörbom, D. (1982). Recent developments in structural equation modeling. Journal of marketing research, 19(4), 404-416. doi:10.1177/0022243782019004.

[117] Gong, Y., Yang, J., & Shi, X. (2020). Towards a comprehensive understanding of digital transformation in government: Analysis of flexibility and enterprise architecture. Government Information Quarterly, 37(3), 101487. doi:10.1016/j.giq.2020.101487.

[118] Tortorella, G. L., Fogliatto, F. S., Saurin, T. A., Tonetto, L. M., & McFarlane, D. (2022). Contributions of Healthcare 4.0 digital applications to the resilience of healthcare organizations during the COVID-19 outbreak. Technovation, 111, 102379. doi:10.1016/j.technovation.2021.102379.

[119] Chesbrough, H., & Bogers, M. (2014). Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. New Frontiers in Open Innovation. Forthcoming, 3-28, Oxford University Press, Oxford, United Kingdom. doi:10.1093/acprof:oso/9780199682461.003.0001.

[120] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). Exploratory factor analysis multivariate data analysis. Prentice Hall, New Jersey, United States.

[121] Chih-Pei, H. U., & Chang, Y. Y. (2017). John W. Creswell, research design: Qualitative, quantitative, and mixed methods approaches. Journal of Social and Administrative Sciences, 4(2), 205-207.

[122] Dengler, K., Hiesinger, K., & Tisch, A. (2022). Digital transformation: The role of computer use in employee health. Economics and Human Biology, 46, 101137. doi:10.1016/j.ehb.2022.101137.

[123] Khalil, S., & Belitski, M. (2020). Dynamic capabilities for firm performance under the information technology governance framework. European Business Review, 32(2), 129–157. doi:10.1108/EBR-05-2018-0102.

Appendix I

SAT	***Strategic Agile Talent***
SI	Strategic Improvisation
FSR	Foresight Strategy with Risk Management
DSR	Digital Strategy and Road Map
IBES	Innovative Based Economy Strategy
TOT	***Transdisciplinary Ontology Talent***
LRA	Learning Agility with Reconcile Adaptability
OIM	Open Innovation and Munificence and Munificence (OIM)
DKM	Digital Literacy with Knowledge Management
ORI	Ontology of Realities and Inseparable thematic
EAT	***Enterprise Architecture Talent***
BITEA	Business-IT Ecological Amalgam
MDIG	Modular Architecture with Insight Governance
BPMN	Business Process Model Notation (BPMN)
ASSO	Asset Orchestration
MMT	***Mental Model Talent***
EUC	Exponential Unbound Cognitive
EM	Entrepreneur Mindset
SNW	Social Networking
CIM	Creativity and Idea Management