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Employees' Experiences of Innovation-Oriented Ethical Climates in the Technical Service Sector in Thailand

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ABSTRACT

As Thailand undergoes a strategic shift toward Industry 4.0, technical professionals are increasingly confronted with a new and demanding layer of workplace pressure. This study explores the lived experiences of these workers as they navigate innovation-oriented ethical climates, specifically focusing on the friction that arises when high-stakes technical demands clash with personal well-being. By conducting in-depth inquiries with fifteen practitioners across both Small and Medium Enterprises (SMEs) and large-scale firms, this research gathered a diverse range of perspectives on the reality of modern technical service work. The findings reveal that innovation is rarely experienced as a simple professional benefit; instead, it frequently serves as a double-edged sword where growth and opportunity are inextricably linked to intense stress and persistent resource shortages. The data underscores that while SMEs provide agility, they lack the institutional support structures found in larger corporations. Ultimately, the results suggest that successful innovation requires more than technological advancement; it demands a fair, transparent leadership style and a profound commitment to psychological safety. This paper offers a practical roadmap for managers seeking to build innovative workplaces that remain human-centric and sustainable.

KEYWORDS: *Innovation-oriented ethical climate, Technical service sector, Employee experience, Thailand, Industry 4.0.*

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I. INTRODUCTION

The technical service sector in Thailand-encompassing critical areas such as factory automation, machine maintenance, and IT integration-serves as the backbone of the nation's industrial development under the Thailand 4.0 policy framework. This sector does not merely provide essential technical support but also acts as a primary engine for innovation by constantly weaving emerging technologies into the fabric of daily operations. However, this progress arrives with a significant human cost, as recent evidence suggests that service industries face mounting pressure to innovate rapidly simply to maintain competitiveness in increasingly volatile global and regional markets [1].

It is crucial to understand that innovation is not merely a technical or operational change; it is a force that profoundly shapes organizational culture and the collective employee experience. Professionals find themselves at the absolute center of this transformation, forced to adapt to new processes, digital tools, and shifting client expectations in real-time. Ethical climate theory suggests that shared perceptions of "what is right and expected" within an organization act as a primary guide for how employees behave and perceive their roles [2]. For instance, when an organization actively emphasizes fairness, transparency, and support, employees tend to feel a sense of security that allows them to experiment and propose disruptive ideas. In stark contrast, when a workplace focuses almost exclusively on immediate results and aggressive deadlines, employees may experience innovation as a source of dread or pressure rather than an opportunity for advancement, even in cases where innovation is formally promoted as a corporate goal [3].

Within the Thai technical service sector, the balance between innovation and well-being is particularly critical. Organizational scale plays a decisive role in

this dynamic; while Small and Medium Enterprises (SMEs) often offer greater flexibility and agility, they frequently struggle with a lack of resources. Conversely, large firms typically provide more formalized systems and structural stability but often lack the agility required for rapid pivots. These differing organizational contexts create distinct ethical climates that dictate how innovation is experienced and processed by the workforce. Therefore, the key challenge for modern leadership is to encourage necessary innovation while simultaneously safeguarding the psychological well-being of the employees driving it.

Research on ethical climate and innovation has historically been conducted in isolation. While studies on innovation climate have highlighted how supportive environments foster creativity [4], [5], research on psychological safety has shown that employees are far more willing to take calculated risks in problem-solving when they feel supported by their peers and supervisors [6]. More recent work has begun to bridge these concepts by linking leadership style and ethical climate to employee motivation within the service sector [7]. However, there remains a clear gap in understanding how technical professionals in Thailand specifically interpret these innovation-oriented climates. To address this void, the current study utilizes a qualitative approach grounded in thematic analysis [8] to explore these lived experiences, ensuring that the human spirit of innovation is not undermined by organizational demands.

This study aims to:

1. Explore how employees perceived innovation-oriented ethical climates in the technical service sector in Thailand.
2. Identify the factors that led employees to interpret innovation as either opportunity or pressure.
3. Compare experiences between SMEs and large firms
4. Provide recommendations for managers and clients on balancing innovation demands with employee well-being.

The research questions of this study were:

1. How did employees describe the innovation-oriented ethical climate in their organizations?
2. What factors led employees to interpret innovation as an opportunity or as a source of pressure?
3. How did employee experiences differ across small and medium-sized enterprises (SMEs) and large firms?
4. How did managers or clients balance innovation demands with employee well-being from the employees' perspectives?

II. Literature Review

The theoretical framework for this study is built upon Ethical Climate Theory, defined in [2] as the collective understanding of what constitutes "right" behavior within an organization. In the context of Thailand's technical service sector, this climate acts as a normative framework that dictates how employees handle the dual pressures of maintaining ethical standards while pursuing technical breakthroughs. Research suggests that while a "caring" climate fosters support, an "instrumental" climate focused purely on self-interest often leads to heightened stress and professional exhaustion [9].

Innovation-Oriented Ethical Climate (IOEC)

This study places a specific emphasis on the Innovation-Oriented Ethical Climate (IOEC), a specialized framework where ethical integrity and innovation objectives are viewed as mutually reinforcing rather than conflicting interests. For technical professionals, innovation transcends the mere adoption of new software or hardware; it is experienced as a profound cultural shift within the organization. The essence of such a climate lies in the provision of professional autonomy and a genuine organizational tolerance for mistakes.

As highlighted in [4], when employees perceive that they are granted the freedom to navigate their tasks and that failures are treated as learning milestones rather than personal shortcomings, they develop the psychological security necessary to propose and test truly disruptive ideas. This creates a "safe harbor" for creativity, where the risk of failure is balanced by the support of the ethical environment. Conversely, in institutional environments where deadlines are chronically unrealistic or where technical setbacks are met with punitive measures, the spirit of innovation is inevitably stifled. In these high-pressure settings, as analyzed in [10], innovation is no longer perceived as an empowering growth opportunity. Instead, it is transformed into a significant source of professional pressure and anxiety, where the fear of punishment outweighs the drive for progress. Ultimately, the way an organization handles mistakes and time constraints determines whether its climate fosters a sustainable path toward Industry 4.0 or leads to a culture of institutional dread and burnout.

The Industry 4.0 Landscape in Thailand

The strategic pivot toward Industry 4.0 within the Thai industrial landscape has effectively elevated technical service providers-ranging from specialized automation experts to complex IT system integrators-to a position of paramount importance for national development [1]. However, this evolving environment yields a significant and unique dichotomy regarding

how professionals experience their workplace. For those operating within Small and Medium Enterprises (SMEs), the climate is often defined by a high degree of agility and lean operational structures that allow for rapid adaptation to shifting client demands. Yet, this flexibility frequently comes at a heavy cost, as chronic resource deficits often force technical staff into a challenging multitasking environment. In such settings, employees are required to navigate unpredictable workloads without the buffer of a large support staff, a reality that can transform the creative spark of innovation into a persistent source of professional strain and workplace stress [11].

In stark contrast, large-scale firms function as structural fortresses of stability, providing employees with dedicated training resources and expansive logistical support that SMEs simply cannot match. However, this organizational security is frequently offset by what practitioners describe as "bureaucratic friction." The presence of rigid hierarchies and complex approval layers can unintentionally signal to the workforce that trial-and-error or creative experimentation is unwelcome. Consequently, this creates a paradoxical environment where the very initiative required for Industry 4.0 progress is stifled by the weight of administrative caution and procedural inertia, ultimately influencing how technical professionals perceive their role within the broader innovation mandate [12].

The Role of Psychological Safety and Leadership

At the heart of the technical professional's journey lies the critical concept of Psychological Safety [6], which serves as the bedrock for any high-functioning, innovation-driven environment. Within the specific cultural landscape of Thailand, where deeply ingrained hierarchical structures often dictate the flow of communication, leadership style emerges as the primary architect of the innovation climate. It is the leader who determines whether the workplace feels like a collaborative laboratory or a high-pressure assembly line. Transformational leaders who actively prioritize transparency and institutional fairness are capable of significantly mitigating workplace anxiety, effectively re-framing daunting technical challenges as shared opportunities for collective growth rather than individual burdens.

When this ethical foundation is absent or neglected, the pursuit of innovation is frequently stripped of its professional value. In such cases, innovation goals run the risk of being perceived as "excessive personal favors" or exploitative demands that place an unsustainable weight on the employee. Without the protective filter of ethical leadership, the drive for technological advancement can quietly dismantle employee well-being, replacing trust with a sense of institutional dread. Ultimately, the presence of a healthy ethical climate, built on trust and a genuine concern for the practitioner, is what ensures that discretionary effort and job satisfaction remain sustainable over the long term [13].

Research Gap and Qualitative Approach

Despite the growing volume of academic literature addressing industrial transformation and ethical climates, a significant strategic void remains in understanding how these interconnected factors manifest specifically within Thailand's technical service sector. Much of the existing research in this field has relied heavily on quantitative methodologies, which-while valuable for identifying broad trends and statistical correlations-often overlook the nuanced and deeply personal lived experiences of the professionals active on the ground. It is precisely this lack of human-centric data that creates a gap in our current knowledge, as numbers alone cannot capture the "messiness" of navigating professional ethics during a technological shift.

By adopting an exploratory qualitative approach, this research aims to bridge that divide by capturing the authentic insights and narratives in the employees' own words. Such a methodological choice offers a significantly deeper understanding of how the organizational climate truly functions as a living entity, shaping the future trajectory of innovation in Thailand through the eyes of those who are expected to lead it [14]. This qualitative lens provides the necessary "thick description" to move beyond surface-level statistics and into the heart of professional reality, offering a rare glimpse into the human spirit that fuels industrial progress [15].

III. Methodology

Research Design and Paradigm

The architectural foundation of this inquiry is a qualitative exploratory design, a choice made specifically to navigate the intricate and often "messy" lived experiences of technical professionals within Thailand's shifting industrial landscape. While quantitative methods are effective at identifying broad trends, they often fail to capture the subtle undercurrents of human emotion and ethical tension that define a workplace. Because innovation-oriented ethical climates are inherently subjective and rooted in individual perception, a qualitative lens is indispensable. It allows the researcher to move beyond the cold finality of statistical metrics, instead focusing on uncovering the deep-seated "meaning" that employees attach to their daily professional roles [16].

This study is firmly grounded in a constructivist paradigm, a philosophical stance that rejects the idea

of a single, objective reality. Instead, it operates on the belief that workplace phenomena-such as the perception of stress or the feeling of professional opportunity-are not fixed truths but are co-constructed through the ongoing, lived interactions between leadership and staff. By adopting this paradigm, the research acknowledges that the "ethical climate" of a factory or a tech firm is a living entity, constantly being reshaped by every conversation, policy shift, and management decision. This perspective is vital for understanding Thailand's technical sector, where the pressure of Industry 4.0 is not just a technological requirement but a shared psychological experience that varies from one individual to the next.

Participants and Sampling Strategy

In alignment with the exploratory nature of this research, a purposive sampling strategy was employed to select a cohort of fifteen participants currently active in Thailand's automation, maintenance, and IT integration sectors. Rather than seeking a random sample for the sake of generalizability, purposive sampling allowed for the intentional selection of individuals who possess "information-rich" experiences regarding the intersection of ethics and innovation. The target was to assemble a strategic cross-section of the industry that reflects the diverse reality of Thailand's workforce.

To ensure a comprehensive and multi-layered view of the sector, the sample was carefully curated to include a mix of early-career professionals, who have been in the field for less than a year, and seasoned industry veterans with over two decades of experience. This generational gap is a critical variable; it provides a rare glimpse into how ethical climates are perceived across different stages of professional socialization. For a fresh graduate (P14), innovation might represent a daunting challenge to their basic competency, whereas for a veteran (P10), it might be viewed as a necessary evolution of a long-term career.

Furthermore, the sampling strategy intentionally included participants from two distinct organizational typologies: Small and Medium Enterprises (SMEs) and Large-scale Corporations. This allows the study to facilitate a comparative analysis of how the sheer availability of resources-or the lack thereof-influences the "ethical air" that employees breathe. By looking at these two extremes, the research can identify how organizational hierarchy and financial stability act as moderators for the spirit of innovation, uncovering why a technician in a lean SME might feel "forced" to innovate, while their counterpart in a large corporation might feel "stifled" by the very systems meant to support them.

Data Collection and Analysis

The logistical realities of engaging with technical professionals in Thailand-many of whom manage unpredictable on-site schedules in industrial zones such as Chonburi or Rayong-necessitated a highly flexible and inclusive data collection strategy. To achieve this, I employed a strategic hybrid approach that combined synchronous and asynchronous methods. This design was not merely for convenience; it was a deliberate attempt to respect the participant's privacy and professional boundaries while maximizing the depth of the qualitative data.

The first component of this strategy involved in-depth semi-structured interviews (n=7). These sessions were conducted via telephone or encrypted online calls, typically lasting between 20 to 30 minutes. The semi-structured nature of these interviews was vital, as it allowed for a "guided conversation" where participants could stray from the script to share spontaneous reflections on specific workplace incidents. These interviews provided the "narrative core" of the study, allowing me to probe deeper into the emotional and ethical nuances of their experiences-such as the specific moment an innovative project shifted from being an exciting challenge to an overwhelming burden.

Recognizing that Thailand's industrial culture is often defined by strong hierarchical structures, the second component of the data collection involved written qualitative responses (n=8) collected via Google Forms. This format was a crucial ethical choice, as it offered a higher degree of anonymity for those who might have felt hesitant to speak openly in a recorded interview. Furthermore, the asynchronous nature of the forms accommodated participants with restricted or high-pressure schedules, ensuring that their voices were not excluded due to the relentless pace of their technical duties. Despite the difference in format, both groups addressed the same core inquiries, focusing on their perceptions of fairness, the authenticity of leadership support, and the systemic factors that dictate whether innovation is viewed as a professional "win" or a catalyst for burnout.

Data Analysis: Thematic Framework

The analysis of the gathered data followed the rigorous six-step thematic framework proposed in [8]. This process was not viewed as a simple linear progression but rather as a recursive and iterative journey that required constant movement back and forth between the raw data and the emerging conceptual themes. The initial phase focused on familiarization, which involved transcribing the interview recordings and repeatedly reviewing the written responses. During this stage, the researcher

was immersed in the data to sense the overall tone of the participants, noting the subtle differences in language between junior technicians and senior managers.

Following familiarization, a transition was made into the systematic coding phase. Here, the data were combed for recurring patterns and significant statements that highlighted the tension between innovation as pressure and innovation as opportunity. This coding process was largely inductive, allowing the themes to emerge organically from the participants' lived realities. These codes were then organized into broader categories, leading to theme development. It was during this stage that the primary narratives of *Resource Scarcity* in SMEs and *Bureaucratic Friction* in large corporations began to take shape as the dominant architects of the ethical climate.

The final and most critical stage was the refinement of themes. This involved a meticulous comparison between the experiences of SME employees and those in large firms to ensure that the findings accurately reflected the diverse dataset. By mapping the codes against the organizational scale, it was possible to confirm that the themes were not just general observations but were deeply influenced by the structural realities of the participants' workplaces. This level of analytic rigor ensures that the final results are not just a description of "what was said," but a deeper interpretation of the innovation-oriented ethical climate in Thailand's technical sector.

Trustworthiness and Ethical Safeguards

To ensure the credibility and dependability of the findings, I utilized member checking by sharing summaries with participants for verification [17]. Reflexivity was maintained through a research journal to monitor potential biases stemming from my own background in the industry.

Ethically, the study prioritized anonymity and autonomy. All participants provided informed consent, and pseudonyms were used throughout the report. Data were stored in secure, password-protected files to maintain strict confidentiality. While the sample size is context-specific and not intended for broad statistical generalization, the "thick descriptions" provided in the results offer transferable insights for managers and policymakers in similar emerging industrial contexts.

IV. Results and Findings

The results of this study are derived from a diverse group of 15 technical professionals in Thailand. As shown in Table 4.1, the participants represent a multi-generational spectrum-from fresh graduates (P14) to industry veterans with 20 years of experience (P10). This diversity is crucial, as it allowed for a comparative analysis between the agility of SMEs and the structured environment of large corporations.

Table 4.1: Participant Profile Summary

ID	Data Method	Role	Experience	Company Type
P1-P7	Interview	Engineers/Technicians	3 - 20+ Years	SME & Large
P8-P15	Google Form	Factory Staff/Managers	4 Mo - 20 Years	SME & Large

Thematic Overview

Through rigorous thematic analysis, four primary themes emerged that define the innovation-oriented ethical climate in Thailand's technical sector (Table 4.2).

Table 4.2: Summary of Key Themes

Theme	Core Focus
1. The Duality of Innovation	Balancing personal growth against relentless deadlines.
2. Organizational Scale	SME agility vs. Large firm bureaucratic stability.
3. Support Systems	The necessity of mentorship and dedicated "learning time."
4. Leadership Culture	Psychological safety and the "filter" of management.

Theme 1: Innovation as a "Double-Edged Sword"

A central finding of this research is that innovation is never experienced as a neutral or purely technical process by the workforce. Instead, participants consistently described it through the lens of a duality, functioning simultaneously as a significant opportunity for professional empowerment and a source of intense workplace pressure.

For early-career participants, such as P13, innovation serves as a vital stage to prove their professional worth, with this participant reflecting that the process allowed them to learn, develop themselves, and showcase their ability within a competitive field. This sentiment was echoed by more senior staff like P6, who viewed technological shifts through the lens of operational efficiency, noting that new technology fundamentally makes tasks easier while reducing the frequency of manual errors.

However, the "dark side" of this innovation duality is often inextricably tied to the reality of unrealistic timelines and systemic demands. P1 stated bluntly that time remains the primary source of pressure in the industry, while P7 shared a poignant example of how the implementation of Internet of Things (IoT) systems-often celebrated as progress-actually created a "seven-day work week" due to the constant, relentless nature of digital alerts.

The primary insight derived from these narratives is that innovation shifts from being a professional opportunity to a psychological burden the moment it is perceived as being "forced" upon the individual without adequate resource adjustment. This was captured perfectly by P5, who noted that when they have the desire to engage with a new technology, it is viewed as an opportunity; however, the moment it becomes a compulsory demand without support, it is transformed into a source of immense pressure.

Theme 2: Agility vs. Stability (SMEs vs. Large Firms)

The research data further reveals a stark contrast in how the physical scale of an organization dictates the prevailing ethical climate, confirming that physical structure acts as a powerful architect of internal perception. In the context of Small and Medium Enterprises (SMEs), which participants often characterized as an intensive "trial by fire," employees frequently find themselves in a position where they must "stand alone." P5 described this SME experience as a profound necessity to rely on oneself, a reality born from lean operations. While this independence often fosters a unique brand of professional resilience and rapid decision-making, it is also a source of chronic stress due to pervasive resource scarcity. This was corroborated by P9, who noted that nearly eighty percent of the workplace pressure in such settings is directly attributable to a chronic lack of manpower. Yet, despite these hardships, the SME environment allows for a pace of skill acquisition that is rarely matched in more rigid corporate settings.

In contrast, Large Corporations function as a "structured fortress," providing employees with a robust safety net composed of expansive budgets, specialized departments, and stable support systems. P3 highlighted that the sheer volume of available systems and personnel makes the day-to-day technical grind considerably more manageable. However, this organizational stability often incurs the hidden cost of "bureaucratic drag." The data suggests a fascinating split in perception within these large firms; while some, such as P11, view rigid procedural checks as a vital "master plan" for quality assurance, others experience these same systems as stifling barriers that extinguish the very creative sparks they were intended to protect.

Theme 3: The "Learning Time" Mandate

One of the most actionable and ethically significant findings of this study is the critical role of Learning and Development (L&D). Participants argued with conviction that L&D should not be viewed as a corporate "bonus" or a peripheral benefit, but rather as a foundational ethical requirement for any innovation-oriented climate. A strong and consistent preference emerged for mentorship over technical manuals, with P7 emphasizing that senior guidance serves as the most effective reducer of workplace stress. This is because seasoned colleagues provide more than just technical fixes; they offer the social wisdom and "soft skills" required to navigate complex and demanding client relationships.

Nevertheless, the potential for such mentorship is frequently neutralized by what participants described as a systemic lack of dedicated "practice time." A recurring grievance, observed by P12, is that when project cycles are accelerated without allowing for adequate buffer zones, the act of learning itself is immediately compromised. In these high-velocity environments, learning ceases to be a professional opportunity and is instantly transformed into a source of mandatory performance pressure, suggesting that for an innovation climate to be truly ethical, time must be treated as a protected resource.

Theme 4: Leadership as the Climate "Filter"

Ultimately, the research indicates that management behavior serves as the final and most influential "filter" through which the innovation experience is processed by the technical workforce. A key component of this filter is the establishment of Psychological Safety. Workplaces that handle technical errors with encouragement rather than blame-as exemplified by the experiences of P4-foster a culture of risk-taking that is essential for both individual creativity and team performance.

Furthermore, effective managers are perceived as strategic protectors or "shields" for their teams. P6 noted that the most respected leaders are those willing to "reason with clients" to find a middle ground, effectively protecting their staff from external burnout and unrealistic demands. Conversely, when leadership fails to provide fairness or clear goals, it inevitably breeds institutional cynicism. P9 pointed to favoritism and inconsistent reward systems as significant demotivators that undermine the integrity of the entire innovation-oriented ethical climate. This

confirms that without a filter of fair and transparent leadership, the drive for technological advancement can quickly become an unsustainable burden.

Summary

In summary, these findings demonstrate that within Thailand's technical service sector, innovation is a deeply human experience rather than a purely technological one. Whether an employee views the shift toward Industry 4.0 as a path to professional mastery or a road to exhaustion is rarely determined by the tools they use. Instead, their reality is filtered through the direct support of their leaders, the scale and resource availability of their organization, and the tangible presence of the mentorship and time required to grow alongside the technology.

Fig. 1. Word cloud of key themes identified from semi-structured interviews.

V. Discussion, Conclusion, and Implications

Discussion: The Paradox of Innovation-Oriented Ethical Climates

The findings of this research facilitate a move beyond the reductionist view of innovation as a purely technical objective, instead framing it as a lived and deeply ethical experience. A central revelation of this inquiry is the existence of a persistent duality, where innovation functions simultaneously as a catalyst for professional empowerment and a pervasive source of workplace pressure. The results support the idea that an innovation-oriented ethical climate is inherently ambivalent within the Thai technical sector. While participants-particularly younger professionals like P13 and P14-express a sense of empowerment through their mastery of new technologies, this growth is constantly shadowed by "technostress" and the weight of aggressive project deadlines.

This specific persistence of tension suggests a divergence from certain existing perspectives that argue organizations possess the capacity to eventually shift their internal climate from one characterized by pressure toward one defined primarily by opportunity [17]. In contrast, the evidence gathered in this study indicates that this duality is not a temporary phase but a structural and persistent condition. Within Thailand's technical landscape, employees do not merely "overcome" pressure; they are forced to navigate a continuous and demanding balancing act between the drive for technological excellence and the maintenance of personal well-being.

The Moderating Effect of Organizational Scale and Career Stage

A novel insight emerging from this research is that organizational scale does not dictate the experience of innovation in a vacuum; rather, it is significantly moderated by the individual's career stage. The data reveals that Small and Medium Enterprises (SMEs) function as an intensive "training ground," offering high levels of agility and faster decision-making but simultaneously demanding that staff multitask and "wear all hats," as described by P5. While this environment fosters rapid skill acquisition, it often places an unsustainable burden on the workforce due to chronic resource deficits [11].

In stark contrast, large-scale firms function as a "resource fortress" of stability, providing expansive support systems that SMEs lack. However, this organizational security is frequently offset by bureaucratic friction, which can be interpreted as either a protective safety net or a restrictive creative barrier depending on the specific needs and seniority of the employee. The finding that senior staff generally prefer the structured environment of large firms while junior staff find unique value in the "trial by fire" provided by SMEs adds a critical new layer to existing literature regarding employee creativity [18].

This nuance provides a strategic roadmap for talent retention, suggesting that organizational fit is deeply tied to an individual's professional trajectory.

Management as the Ethical "Filter"

Perhaps the most critical discovery in this discussion is that management behavior serves as the definitive filter through which the organization's ethical climate is processed. In the eyes of the technical workforce, there is no separation between the behavior of a manager and the actual ethics of the organization. Managers who act as "shields"-effectively negotiating with clients to protect their teams from burnout and providing dedicated "learning time"-successfully transform innovation into a shared professional journey rather than a coercive demand. This behavior reinforces the vital importance of psychological safety in Industry 4.0 environments, proving that trust and leadership support are essential predictors of discretionary effort [6].

Conclusions

This study concludes that an effective innovation-oriented ethical climate in Thailand is grounded in three fundamental pillars: Resource Transparency, Mentorship, and Fairness. First, it must be acknowledged that innovation is a double-edged sword; it is never a neutral process and will act as either a path to mastery or a significant stressor depending entirely on the surrounding support system.

Second, the support provided to the workforce must be tangible and specific. Technical employees do not seek vague administrative "support"; instead, they require active senior mentorship, hands-on trial runs for new systems, and protected time to learn without the immediate pressure of project delivery. Finally, leadership style remains the primary architect of the climate. Managers who prioritize human well-being and maintain strict fairness in rewards, while actively avoiding favoritism, create the only sustainable path for long-term technological innovation in Thailand's evolving industrial landscape.

Implications of the Study

Theoretical Implications

This research makes a distinctive contribution to the academic literature by extending Ethical Climate Theory [2] into the high-pressure domain of Industry 4.0. Traditionally, ethical studies in the workplace have focused on compliance and general integrity; however, this study proves that in technical sectors, "ethical" behavior must evolve to include the fair and transparent allocation of cognitive resources, specifically learning time. By highlighting that the failure to provide space for adaptation is a breach of the innovation-oriented ethical contract, this study bridges the gap between organizational ethics and technical performance. Furthermore, the introduction of "Career Stage Moderation" offers a novel variable for future researchers. It suggests that the perception of organizational scale is not static but is filtered through an individual's professional maturity-a finding that adds significant depth to previous models of employee creativity [18].

Practical Implications for Managers

The findings provide a strategic roadmap for leadership across Thailand's industrial landscape. For Small and Medium Enterprises (SMEs), where financial capital for Research and Development is often limited, managers should prioritize the development of internal mentorship networks. By leveraging the expertise of senior staff to guide juniors through "trial by fire" scenarios, SMEs can foster a resilient culture where skill acquisition is rapid and supported. Implementing small-scale, low-risk pilot projects allows employees to innovate without the paralyzing fear of catastrophic system failure, effectively turning a lean operation into an agile learning laboratory.

In contrast, leadership within Large-scale Corporations must focus on mitigating the "bureaucratic drag" that often stifles the creative spirit of specialized teams. This can be achieved by creating "innovation safe zones"-protected organizational pockets where traditional approval hierarchies are streamlined to allow for rapid experimentation. Regardless of company size, a universal takeaway is the recognition of "time" as a vital ethical resource. It is imperative for managers to negotiate realistic "buffer zones" with clients, ensuring that technicians have the mental and temporal space to integrate new technologies. When time is treated as a shared asset rather than a tool for exploitation, organizations can foster the long-term trust and job satisfaction necessary for sustainable growth [13].

Methodological Reflection

Reflecting on the research journey, the decision to employ a hybrid data collection strategy was fundamental to the study's success. The combination of in-depth semi-structured interviews with anonymous written qualitative responses via Google Forms addressed the unique challenges of the Thai technical sector. This approach ensured inclusivity by accommodating the relentless schedules of on-site engineers and the privacy preferences of those working in tight-knit professional circles.

This methodological flexibility allowed for the collection of "thick descriptions" that moved beyond surface-level observations, capturing the authentic "lived experiences" of the participants. By offering multiple avenues for participation, the study was able

to bridge the gap between spontaneous reflection and carefully considered narrative, ensuring that the resulting thematic analysis was grounded in a truly representative and diverse dataset [16]. This reflection underscores that in modern industrial research, the method must be as adaptable as the technology it seeks to study.

VI. Conclusion and Recommendations

Conclusion

This study has explored the lived experiences of technical professionals as they navigate the complexities of Thailand's transition toward Industry 4.0. The findings demonstrate that an innovation-oriented ethical climate is not a static or fixed organizational feature; rather, it is experienced by employees as a dynamic and often contradictory phenomenon. The research concludes that innovation in the technical service sector functions effectively as a "double-edged sword." While it undeniably offers significant pathways for professional growth and advanced skill acquisition, it simultaneously introduces systemic pressures that can lead to exhaustion. These pressures are primarily driven by chronic resource scarcity within Small and Medium Enterprises (SMEs) and persistent bureaucratic friction within large-scale firms.

A critical discovery of this inquiry is that technology alone does not define the success or health of an innovation climate. Instead, it is the management "filter" that serves as the ultimate determinant of whether an employee perceives a technological shift as a growth opportunity or a primary source of burnout. Leadership that actively prioritizes psychological safety, mandates dedicated learning time, and enforces fair reward systems is the only sustainable way to foster a truly innovative and resilient technical workforce in Thailand. Ultimately, the success of Industry 4.0 depends less on the machines themselves and more on the ethical environment in which the humans operating them reside.

Recommendations for Practice

Based on the thematic analysis, several strategic recommendations are proposed for organizations within the technical service sector to better balance innovation demands with employee well-being. For Small and Medium Enterprises (SMEs), the priority should be to institutionalize informal but structured mentorship programs. Since SMEs often lack the expansive research and development budgets of their larger counterparts, they must leverage their inherent agility by using senior guidance to bridge skills gaps. This approach significantly reduces the anxiety of early-career staff who are frequently forced to multitask. Furthermore, managers in SMEs must embrace "scope realism" by setting realistic project boundaries and encouraging innovation through low-risk "pilot" projects rather than high-pressure, mandatory shifts that lack clear institutional support.

For Large Corporations, the focus must shift toward reducing bureaucratic drag. Leadership should identify and proactively streamline innovation bottlenecks by creating fast-track approval processes for technical experimentation. To prevent the "monotony of specialization" that often leads to disengagement, large firms should implement cross-functional project rotations. This allows experts to maintain a broader sense of contribution and continuous learning, keeping the creative spark alive within a highly structured environment.

Across all organizational contexts, it is imperative for managers to treat "learning time" as an ethical resource rather than a luxury. By allocating protected hours for training and development, organizations ensure that innovation is perceived as a long-term investment in the individual rather than a mere demand on their immediate productivity. Finally, a "no-blame culture" must be fostered, where leaders actively build psychological safety by treating technical errors as learning milestones rather than performance failures.

Limitations and Future Research

While this study offers deep qualitative insights derived from fifteen participants, its primary limitation lies in its context-specific nature. The findings are highly indicative of the realities within the Thai technical sector but may not be universally generalizable to other regions or industries. Future research should consider a quantitative validation phase, utilizing a larger-scale survey to test the "duality of innovation" themes across a broader and more diverse population. Additionally, a longitudinal analysis would be highly beneficial to track how an individual's perception of innovation shifts over time as they move from the "training ground" of an SME to the stable, structured environment of a large corporation. Such studies would provide a more granular understanding of the long-term interaction between career stages and organizational ethical climates.

Final Summary

In conclusion, the future of Thailand's technical service sector depends on a decisive shift in focus from technology-centric to human-centric innovation. For an innovation-oriented ethical climate to be truly effective, it must be grounded in the fundamental values of fairness, transparency, and a genuine commitment to professional development. The

organizations that will achieve both competitive agility and long-term sustainability are those that recognize that their greatest assets are not the systems they build, but the people who have the courage and support to innovate within them.

VII. Acknowledgment

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