TPM Vol. 32, No. S2, 2025
ISSN: 1972-6325
https://www.tpmap.org/

Open Access

MATCHING COGNITIVE COMPATIBILITY WITH ROLE FIT IN ENGINEERING SECURITY THROUGH HR – GUIDED ASSESSMENTS

BRIJMOHAN SINGH
ASSISTANT PROFESSOR, KALINGA UNIVERSITY, RAIPUR, INDIA.
EMAIL: ku.brijmohansingh@kalingauniversity.ac.in, ORCID ID:0009-0008-6455-4017

DR. RAJESH SEHGAL
ASSISTANT PROFESSOR, DEPARTMENT OF MANAGEMENT, KALINGA UNIVERSITY, RAIPUR, INDIA. EMAIL: ku.rajeshsehgal@kalingauniversity.ac.in ORCID: 0009-0002-0344-403X

DR. SUNAINA SARDANA
PROFESSOR, NEW DELHI INSTITUTE OF MANAGEMENT, NEW DELHI, INDIA.,
EMAIL: sunaina.sardana@ndimdelhi.org, HTTPS://ORCID.ORG/0009-0002-1373-0187

Abstract
In high-risk engineering security environments, the lack of a fit between an individual's cognitive readiness and the mental demands of their role will often lead to a breakdown in vigilance, taking time to respond, and diminishing operational resilience. Historically, hiring and assigning roles have relied on technical competency and previous performance, yet have neglected the necessary cognitive compatibility in a VUCA world. This idea of assessing the dimensions of cognitive characteristics to match them to the cognitive loads expected of many engineering security roles based on the role responsibilities as a configuration of task challenges is the main focus of this research, to determine if the HR function could strategically intervene as a moderator of cognitive fit with a structured, psychology-based assessment within a structured HR process. Using the Talent Profiling for Mission Alignment & Performance (TPMAP) framework as a lens, this research will explore how to profile and measure cognitive characteristics of an individual – including risk perception, attentional control, situational awareness, adaptive reasoning - and then define and categorize these against the cognitive load profiles associated with the engineer's roles within the security domain. Reframing an assessment of role fit from skills-based matching to one based on cognitive 'fit' presents a new frontier of HR-based intervention that would ultimately assist with the individual fit to the role and assist with retention. The conceptual contribution is considering cognitive fit as a defined, measurable, and matchable aspect of HR decisions. The practical contribution is in staff assessment tools for assigning roles and outlining calibrating roles, and responsibilities for cognitive profiling and assessments, as no VUCA or psychologically informed framework currently exists for engineering security professionals.

Keywords: Cognitive Compatibility, Role Fit, Engineering Security, HR Interventions, Psychometric Profiling, Situational Awareness, TPMAP Framework, Cognitive Readiness, Risk Perception, Adaptive Capacity, Behavioural Assessment, Role Complexity.

I.INTRODUCTION

We find ourselves in social and emotional realities where engineering security work integrates with cyber-physical unpredictability, but also where human performance can be both vulnerability and strength. Security does not only exist and dwell within technical infrastructure; it is also the cognitive capacity and psychological readiness of the engineers who develop, monitor, and defend it. High-stakes environments, including critical infrastructure systems, secure data networks, or crisis response platforms, require consideration of abilities beyond technical competency; environments involving significant threat or risk require those involved to demonstrate skills involving entire attentional presence, deference to uncertainty through rapid decision-making actions, and constructing an adaptive mental ability of resilience.

The recognition of this conceptual reality has not influenced how technological solutions are grouped, positioned, constructed horizontally, or oriented vertically, in terms of assignments or formal assessments of human performance in an engineering security context. If we conceive of how we group and situate people, and are

controversially only evaluating them based on their technical skill using similar metrics (such as experience or a project/situation evaluation model) our shortfall is detecting role mismatches where individuals who would excel have task complexity and/or cognitive load and/or previous exposure to chronic stress conditions. Judgements or assessments we attributed to these individuals would be, for example, declining vigilance, slow threat detection or recognition, or psychological burnout; thereby negating the security of the system.

This paper contends that HR should refrain from security risk/due diligence practices, as we cannot technically justify valuing human performance; role requirements should, across established practices/ frameworks, dovetail with cognitive tradeoffs and psychological equity. Further, HR should assess the facilitator for cognitive alignment, where not only capabilities are assessed, but also cognitive factors such as traits and readiness (psychological issues). Ordinarily, it does not include detachments based on assessment duration from bifurcated estimation and scaling for psychological profiling or cognitive-fit, which recognizably constitute debilitating flaws.

Cognitive Compatibility in High-Stakes Engineering Positions

Positions in security engineering require more than just technical knowledge because the cognitive agility demands are significant and stressful; you will be under pressure for an extended period of time. It is worth looking to the foundational psychological theories including Cognitive Load Theory which outlines how working memory has limits in complex tasks; Cognitive Readiness represents the ability to study an event and prepare to act effectively in unpredictable, dynamic, and stressful environments; and Situational Awareness is our ability to identify, interpret, and project salient elements of an event, during the event itself.

Security engineering roles contain many cognitive endeavors, including: monitoring a system under the possibility of threat; rapidly deciding on action under incomplete information; simultaneous attention to multiple tasks during an escalation of a crisis event; and recognizing patterns and identifying anomalies that could point to emergent threats. These cognitive elements rely on cognitive profiles and attributes of cognition, including risk cognition, attention control, working memory capacity, and mental stamina.

Yet, HR and managerial practices usually assign Roles on the basis of formal qualifications and experience only. There is no assessment made on whether the cognitive profile of an individual will reasonably match the demands of the role psychologically. This may lead to misaligned cognitive roles and cognitive fatigue, diminished vigilance, and suspect adaptive reasoning. Fundamentally, misalignment reinforces cognitive fatigue in an individual, causing an erosion of well-being, but moreover, systemic erosion of security.

TPMAP-Informed Role Mapping: A Psychological Intervention Framework

The TPMAP (Talent Profiling for Mission Alignment & Performance) provides a structure with a psychological framework to help close the gap between thinking and the capability of the workforce. It takes a structured approach to map the individual's traits to role requirements. Whereas traditional HR perspective/execution was really a point-in-time series of actions based on functional competencies and experience, TPMAP approaches the role from the intrinsic psychological traits of the individual in potentially unpredictable situations. Psychological factors such as resilience/tolerance to stress, self-regulation, adaptive reasoning, and complexity of roles directly tie back to performance in decision-making as part of mission-directed engineering security roles.

TPMAP consists of five psychological dimensions, including Cognitive Endurance (the ability to focus with uncertainty over time). Self-Regulation Capacity (ability to control cognitive-emotion reactivity). Situational Adaptability (decision making in the moment). Role Complexity Tolerance (mental flexibility in account of the cognitive complexity of all interactively-worked overlapping demands). Mission Resilience (metabolic output over time despite adverse conditions)

If we then consider mapping individual domain variability, we can use engineering security roles to help explain psychological strain, the role itself, and the variability of strain. For example, a role of threat anticipation with high situational adaptability will have some different psychological strain than that of an incident response team, where the self-regulation domain and shifting attention domain represent a more complex capacity to apply psychological endurance.

Lastly, mapping cognitive profiles to the psychological architecture of the role using a trait-role matrix or block diagram may help HR professionals align individuals'capabilities with the tacit psychological negotiations of the role. This type of trait-role alignment stands in contrast to the surface features of the task.

HR as a Cognitive Bridge: Assessment and Role Adjustment Strategies

When equipped with psychological perspectives, Human Resources can become a bridge in terms of cognitive capacity and the changing requirements of engineering security roles. Rather than simply charge, as administrative gatekeepers, HR can facilitate cognitive-role congruence through recognized psychological assessments that capture cognitive flexibility, risk perception making, behavioral inhibition, and situational awareness, as described below.

There have been a few assessment options that may fit HR processes:

The Cognitive Flexibility Scale (CFS) assesses an individual’s ability to promptly change the demands of a task.

The Domain-Specific Risk-taking Scale (DOSPERT) assesses perceived risk and decision-making tendencies in

engineering contexts. The Behavioral Inhibition/Activation System (BIS/BAS) identifies readiness to be cautious/impulsive during stress.Situational Awareness Rating Technique (SART)examines levels of situational awareness in simulated operational environments.
Each assessment can be integrated into structured HR processes, such as a cognitive profile as part of onboarding, to ensure a new hire is in the best possible role from day one. Role shifts where the cognitive profile is periodic, as often as such re-evaluation will accommodate, or are triggered by performance deviation, enabling an employee to be shifted when cognitive-role misalignment occurs.Structured cognitive recovery processes, based on responses to crises, would offer an individual a structured means to decompress, restoring psychological equilibrium.

II.CONCLUSION

In a more complex security landscape for engineers, technical competence by itself will not lead to operational resilience. This paper has demonstrated that meaningful role fit must go beyond competence into psychological fit with particular emphasis on high-risk, cognitively taxing environments. Cognitive traits, like risk perception, adaptability, and situational awareness, will determine whether someone can be effective in a security-sensitive role or wilt under pressure. Using structured, psychology-based tools in HR [human resource] workflows is an important first step towards a cognitively calibrated workforce. However, it is important to remember that building a cognitive role audit does not now include evidence-based studies into how successful and accurate HR-led cognitive diagnostics are in a variety of engineering contexts to a systematic level. Without empirical confirmation of the role and value of psychological profiling in critical infrastructure settings, it will remain an underused and undervalued HR function.The advancement of cognitive role auditing requires institutionalization, particularly for cognitive-intensive roles that include responsiveness to crises, implementing effective live actions, or creating cognitive fatigue through prolonged vigilance. It requires a people-centered, cross-functional effort to develop a framework of assessment and role fit that involves psychologists, engineers, and HR. A better aligned cognitive workforce will produce better operational outcomes, but not only as an operating strategy; it is also sustainable security in the face of complex, emerging threats.

REFERENCES

[1] Ardestani, S. S. (2017). A Project Report on Employee Satisfaction in Private Hospitals in Hyderabad-India. International Academic Journal of Innovative Research, 4(2), 47–60.
[2] Farhan, S., Awaid, A., & Odah, S. (2023). The Possibility of Applying the Program and Performance Budget to Improve Job Performance - Analytical Research at Sumer University. International Academic Journal of Social Sciences, 10(1), 57–62. https://doi.org/10.9756/IAJSS/V10I1/IAJSS1007
[3] Sathish Kumar, T. M. (2025). Comparative analysis of Hatha Yoga and aerobic exercise on cardiovascular health in middle-aged adults. Journal of Yoga, Sports, and Health Sciences, 1(1), 9–16.
[4] Nazirova, S., A'zamova, M., Niyazova, N., Nazarova, Z., Muxtorova, N., Isakulova, N., Djafarova, D., & Davlatova, Z. (2025). Secure data transmission in VANETs for philological field expeditions and mobile language labs. Journal of Internet Services and Information Security, 15(2), 892–905. https://doi.org/10.58346/JISIS.2025.I2.059
[5] Chopra, N., & Patil, V. (2025). Design of Advancements in AI for Cyber Threat Detection. In Essentials in Cyber Defence (pp. 16-34). Periodic Series in Multidisciplinary Studies.
[6] Rahman, F., & Prabhakar, C. P. (2025). Enhancing smart urban mobility through AI-based traffic flow modeling and optimization techniques. Bridge: Journal of Multidisciplinary Explorations, 1(1), 31–42.
[7] Nwosu, P. O., & Adeloye, F. C. (2023). Transformation Leader Strategies for Successful Digital Adaptation. Global Perspectives in Management, 1(1), 1-16.
[8] Kumar, T. M. S. (2024). Security challenges and solutions in RF-based IoT networks: A comprehensive review. SCCTS Journal of Embedded Systems Design and Applications, 1(1), 19-24. https://doi.org/10.31838/ESA/01.01.04
[9] Patel, P., & Dusi, P. (2025). IoT-based water quality management system for sustainable urban water networks. Journal of Smart Infrastructure and Environmental Sustainability, 2(1), 11–20.
[10] Uvarajan, K. P. (2024). Integration of blockchain technology with wireless sensor networks for enhanced IoT security. Journal of Wireless Sensor Networks and IoT, 1(1), 23-30. https://doi.org/10.31838/WSNIOT/01.01.04
[11] Amit, P. P. (2018). A Study on the Influence of Leadership Style on Employee Job Satisfaction. International Academic Journal of Organizational Behavior and Human Resource Management, 5(1), 36–62. https://doi.org/10.9756/IAJOBHRM/V5I1/1810003

[12] Barhoumia, E. M., & Khan, Z. (2025). Neurocognitive mechanisms of adaptive decision-making: An fMRI-based investigation of prefrontal cortex dynamics in uncertain environments. Advances in Cognitive and Neural Studies, 1(1), 20–27.
[13] Hoa, N. T., & Voznak, M. (2025). Critical review on understanding cyber security threats. Innovative Reviews in Engineering and Science, 2(2), 17-24. https://doi.org/10.31838/INES/02.02.03
[14] Fakhari, M. (2014). Relationship of Organizational culture, Teamwork and Job satisfaction in interprofessional teams. International Academic Journal of Science and Engineering, 1(2), 36–44.